

Final Environmental Impact Report

CANDLESTICK POINT–HUNTERS POINT SHIPYARD PHASE II DEVELOPMENT PLAN PROJECT

Volume III: Final EIR (Section III.N through Chapter VIII)

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San Francisco Redevelopment Agency
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SECTION III.N BIOLOGICAL RESOURCES

III.N.1 Introduction

This section of the EIR discusses existing biological resources within and surrounding the Project site and examines the potential for the Project to (1) result in substantial and adverse direct, indirect, or cumulative impacts to sensitive biological resources (including plants, wildlife, aquatic species, and vegetation communities); (2) interfere substantially with the movement of native fish or wildlife species; (3) conflict with local policies or ordinances protecting biological resources; or (4) conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. This section analyzes both Project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid any identified significant impacts.

Due to the length and complexity of this section, an overall description of the format and structure of the Biological Resources discussion, as well as the general approach to the analysis, is provided to assist the reader in following the discussion. First, while the boundaries of the Project site include the landside areas (i.e., those areas landward of tidal waters) that are depicted on Figure II-2 (Project Site and Context) of Chapter II (Project Description) of this EIR, the Project could result in impacts to aquatic resources that are located directly adjacent to the Project site (in the San Francisco Bay) as the result of the Project's various waterside improvements, including the shoreline improvements required to stabilize and/or reinforce the shoreline, improvements required to provide a marina, and construction of the Yosemite Slough bridge (refer to Appendix N2 [Yosemite Slough Bridge Drawing]). Therefore, this discussion focuses on both on-site landside and off-site aquatic resources.

The Study Area for this biological resources analysis includes both developed and undeveloped portions of HPS Phase II and Candlestick Point, including the entire Candlestick Point State Recreation Area (CPSRA), as well as off-site open waters adjacent to the Project site that would be impacted by Project components (i.e., breakwater, pier, etc.); refer to Figure III.N-1 (Biological Resources Study Area). The

- off-site aquatic resources discussed include Yosemite Slough (except the area of construction, which is included in the on-site impact analysis), the open water area between Candlestick Point and HPS Phase II (known as South Basin), and adjacent open waters that would be impacted by Project components (i.e., breakwaters, gangways, floats, etc.). For purposes of the evaluation of sensitive species, the Study Area is defined as the Project site and a radius of up to 5 miles beyond the Project site.

The Setting discussion describes existing biological conditions, consisting of common plant and wildlife species and habitats, sensitive plant and wildlife species and habitats, and wildlife movement/habitat connectivity conditions. The discussion was prepared by first completing an extensive literature search of potential biological resources within the Study Area, followed by completing several field surveys to document the conditions that do exist or could exist, depending on the time of year. The Setting discussion describes certain biological resources that are defined by state or federal regulations; therefore, detailed descriptions of applicable regulations are provided in the Regulatory Framework section.



SOURCE: HT Harvey, 2009; LSA Associates, 2004.

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FIGURE III.N-1

Candlestick Point — Hunters Point Shipyard Phase II EIR

BIOLOGICAL RESOURCES STUDY AREA

The Impact discussion parallels the Setting discussion in presentation, first by discussing impacts to common species or resources and discussing sensitive species or resources. This section identifies both Project-specific and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid the identified impacts.

III.N.2 Setting

In order to assess existing conditions and potential Project-related impacts, PBS&J staff biologists conducted reconnaissance-level surveys of the Project site on August 9, 2007, May 5, 2008, and July 8, 2008. Surveys focused on identification of vegetation communities, special-status species or their potential habitat, and other biotic resources (i.e., potential wetlands or "other waters" of the US). During surveys, biologists walked transects through each habitat type while recording plant and wildlife species observed in field notes. On July 8, 2008, Navy personnel escorted a PBS&J staff biologist through HPS Phase II. The August 2007 and July 2008 surveys were in the dry season, when most annual, biennial, and perennial herbaceous plant species were dormant or had already died back, leaving only dried plant parts (i.e., leaves, stems, fruits) for identification. Lastly, a rare plant survey was conducted in May 2008. The survey was conducted by walking representative transects through the survey area while recording every plant species observed. Although the survey was conducted within the flowering window for the special-status species that could occur within the Project site, the unusually dry weather resulted in a shorter flowering period and thus, most annual, biennial, and perennial herbaceous plant species were dormant or had already died back for the growing season, leaving only dried plant parts (i.e., leaves, stems, fruits) for identification. If a plant species could not be identified in the field, diagnostic plant structures (i.e., fruits or morphology) were collected for further analysis. Some plants observed during the survey could only be identified to the Genus level.[651]

The "baseline conditions" for this analysis are based on these field surveys, other data collected or research conducted within the Study Area over the past six years (2003–2009), and federal and state agency information resources. Sources consulted include the California Department of Fish and Game's (CDFG) Natural Diversity Database (CNDDB) for the US Geological Survey's (USGS) 7.5-minute San Francisco South and Hunters Point quadrangles; the California Native Plant Society (CNPS) electronic inventory for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles; the US Fish and Wildlife Service (USFWS) Endangered and Threatened Species list for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles; the *Final Report Yosemite Slough Watershed Wildlife Survey*, LSA, July 2004; the *Final Draft Significant Natural Resource Areas Management Plan*, Sections 6.17 and 6.18, San Francisco Recreation And Park Department, February 2006; the *Draft Wetlands Mitigation and Monitoring Plan*, Navy Base Realignment and Closure Program, November 2006; the *Hunters Point Shipyard and Candlestick Point State Recreation Area, Natural Environment Study Report for the Bayview Transportation Improvements Project*, Jones & Stokes, June 2009; the *Final Delineation of Wetlands and Other Waters*, H.T. Harvey & Associates, Revised 13 July 2009 and October 13, 2009; the *Draft Sustainability Plan* for the Project, Arup North America Ltd, March 2009; PBS&J's *Candlestick Point/Hunters Point Shipyard Biological Technical Report* prepared for the San Francisco Redevelopment Agency (refer to Appendix N1 [Biological Resources Technical Report]), San Francisco Planning Department, December 11, 2008 updated November 2, 2009; and Project plans and graphic renderings.

[651] Plants that were identified to the Genus level are not special-status or rare plants, and, therefore, this taxonomic unit of classification does not affect the findings of this report.

- Information from these sources and from PBS&J's reconnaissance-level surveys was used to identify and characterize existing conditions at the Project site, and accordingly, were substantially relied upon for this analysis. In particular, LSA's Yosemite Slough Watershed Wildlife Survey (2004) and the Final Delineation of Wetlands and Other Waters conducted by H.T. Harvey & Associates (2009) provided specific information about the Study Area. LSA coordinated a wildlife survey of the Yosemite Slough Watershed between January 2003 and April 2004.[652] The survey of the Yosemite Slough Watershed included both the entire CPSRA and adjacent open water areas between HPS Phase II and the peninsula that forms the eastern extension of CPSRA.[653] From north to south, the Yosemite Slough Watershed Wildlife Survey Study Area is roughly bordered by Thomas Avenue, Ingalls Street, Carroll Avenue, Arelious Walkder Drive, Arelious Walker Drive, and the Hunters Point Expressway (Figure III.N-1). Although this survey covered only a portion of the Project site, it provides the most comprehensive data set available regarding the occurrence of wildlife in the area, and is thus cited heavily in the descriptions of existing conditions in this section. Also, because the majority of the Project site that was not covered by the Yosemite Slough Watershed Wildlife Survey is developed, we expect wildlife communities elsewhere on the Project site to be similar or depauperate in comparison to, those documented within the Yosemite Slough Survey's study area.

H.T. Harvey & Associates prepared a delineation of wetlands and other jurisdictional waters potentially meeting the regulatory definition of Waters of the United States within a majority of the Project site (February 2009 and revised on July 13 and October 13, 2009).[654] Surveys were conducted in 2008 on September 25 and 26; November 5 and 6; and December 4, 5, and 19; and in 2009 on January 29 and 30 and May 20. The delineation included the examination of the above-mentioned areas for wetlands using the routine determination method outlined in the US Army Corps of Engineers (USACE) Wetlands Delineation Manual. H.T. Harvey assessed topographic features, drainages, potential alterations to site hydrology, and areas of significant recent disturbance, and mapped the High Tide Line (HTL). The USACE verified the findings of the delineation with a Jurisdictional Determination dated August 31, 2009. As indicated on Figure III.N-3 (Wetlands and Other Waters) later in this section, the study area for H.T. Harvey's original wetland delineation did not included several limited areas that are now considered part of the Project site. As a result, H.T. Harvey expanded its original delineation by inspecting these additional areas in the field on October 8, 2009. H.T. Harvey & Associates has amended its wetland delineation report, and verification of jurisdictional boundaries in these additional areas by the USACE is pending.

Existing conditions are described with respect to observed plant species, vegetation communities, common aquatic habitats (i.e., mud flats, open water, and eelgrass (*Zostera marina*) beds), common wildlife (i.e., invertebrates, reptiles and amphibians, birds, and mammals), common aquatic resources (i.e., fish, shellfish, and mollusks), and sensitive species and habitats (sensitive plants, sensitive vegetation communities, sensitive wildlife [invertebrates, birds, terrestrial mammals, and marine mammals], and sensitive aquatic resources [mollusks, fish, and Essential Fish Habitat (see Sensitive Aquatic Resources)]).

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[652] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[653] Ibid.
[654] H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

Observed Plant Species

As described in Appendix N1 to this EIR, a total of 187 vascular plant species were observed within the Project site during all of the biological surveys listed in the Setting section above, 103 of which are non-native. In addition, 66 of the non-native vascular plant species are considered to be invasive plant species.[655] Invasive plants are defined as those that were "moved by humans to another region." These invasive plants have a competitive advantage because they are no longer controlled by their natural predators, and can quickly spread out of control.[656] Widely scattered trees are present and appear to either be horticultural plantings associated with landscaping or represent locally naturalized specimens. Calflora's on-line Plant Name Library was used for the scientific nomenclature for plant names in this section.[657]

Vegetation Communities

For purposes of the biological resources analysis, the Study Area is first described in terms of the vegetation communities it supports, as reflected by Table III.N-1 (Vegetation Communities within the Study Area) and further discussed below. The vegetation communities are defined according to CDFG's Vegetation Classification and Mapping Program of the Biogeographic Data Branch,[658] H.T. Harvey & Associates' wetland delineation for HPS Phase II and Candlestick Point,[659] and PBS&J's Biological Technical Report prepared for the Project.[660]

As depicted in Figure III.N-2 (Study Area Habitats), the Study Area contains four non-aquatic vegetation communities: non-native annual grassland, landscaped areas/ornamental plants, salt marsh, and seasonal freshwater wetland. In addition, approximately 568.80 acres of the Study Area is "urban." This habitat is not classified as a "vegetation community" and is thus not included in the "vegetation communities" table. Urban habitat includes developed or paved areas. The Study Area also contains three aquatic habitats: mud flats, eelgrass beds, and open waters. Table III.N-1 provides the total acreages of each vegetation community within the Study Area. A description of each of the vegetation communities follows this table.

In some cases, vegetation communities may also be considered sensitive vegetation communities. In those cases, and there are three such cases in this analysis, they are also discussed under Sensitive Vegetation Communities, which follows this discussion. The three sensitive communities within the Study Area include salt marsh, eelgrass beds, and seasonal freshwater wetland habitats (also discussed under Sensitive Vegetation Communities).

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655 California Invasive Plant Council (Cal-IPC) Invasive plant definitions 2009. Website: http://www.cal-ipc.org/ip/definitions/index.php. Accessed July 2009.
656 California Invasive Plant Council (Cal-IPC) Invasive plant definitions 2009. Website: http://www.cal-ipc.org/ip/definitions/index.php. Accessed July 2009.
657 Calflora, 2009. Website: http://www.calflora.org/index.html. Accessed July 2009.
658 California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database,* Sacramento, California, September 2003 edition.
659 H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.
660 PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report,* prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009.

Table III.N-1 Vegetation Communities within the Study Area				
Habitat Type	*Candlestick Point*	*Hunters Point Shipyard*	*Yosemite Slough*	*Total Acreage*
Non-native Annual Grassland[a]	30.53	44.19	—	74.72
Landscaped Areas/Ornamental Plants[a]	44.67	—	—	44.67
Salt Marsh[b]	0.93	3.56	0.06	4.55
Seasonal Freshwater Wetland[b]	—	0.20		0.20
Mud Flats/ Open Water*	21.82	169.29	4.43	195.54
Totals	***97.95***	***217.24***	***4.49***	***319.68***

SOURCES:

a. PBS&J, *Bayview Waterfront Project Biological Technical Report* prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009, which is provided as Appendix N1 to this EIR.

b. H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California*, February 2009 and revised July 13 and October 13, 2009.

Acreage discrepancies between the data contained herein and the total approximate acreage of the Study Area are due to the conversion of data from non-GIS to GIS data.

This table does not include the acreage for developed/urban areas (568.80 acres) because this classification is not a recognized vegetation community for purposes of this EIR.

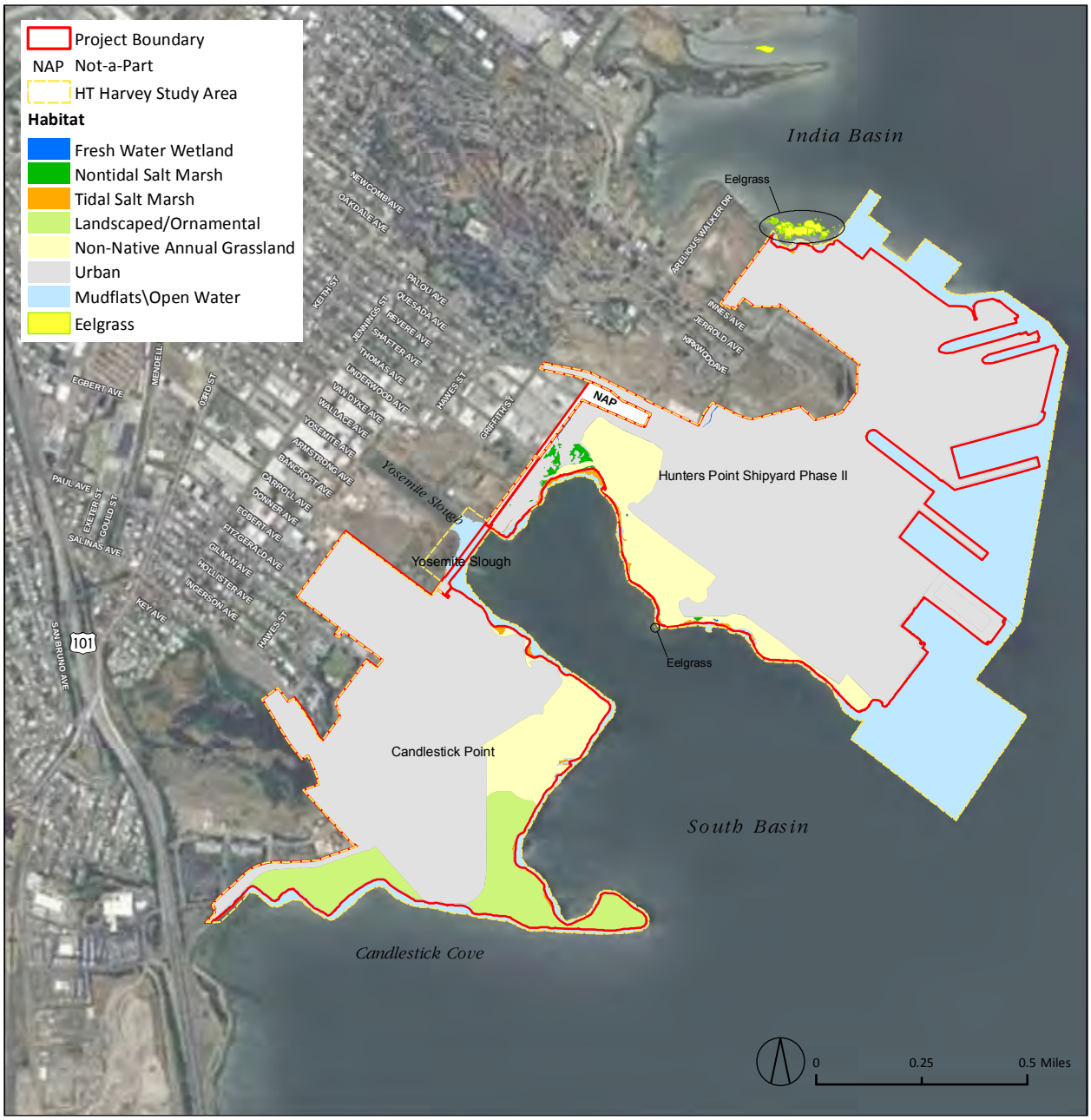
* The open waters located outside of the Project boundary include those adjacent to Candlestick Point, Hunters Point Shipyard, and Yosemite Slough.

Non-native Annual Grassland

Patches of non-native annual grassland habitat are found throughout the Project site and comprise 74.72 acres. Invasive, non-native grasses characterize this community, particularly at HPS Phase II due to the intensive disturbance associated with the Navy's ongoing remediation efforts. The vegetation within this grassland consists of a mixture of invasive annuals such as wild oat (*Avena fatua*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), rat-tail fescue (*Vulpia myuros*), and hare barley (*Hordeum murinum var. leporinum*). Broad-leaf species occurring within the grasslands consist of wild radish (*Raphanus sativus*), painted charlock (*R. raphanistrum*), black mustard (*Brassica nigra*), Mediterranean linseed (*Bellardia trixago*), cut-leaf plantain (*Plantago coronopus*), spring vetch (*Vicia sativa*), red valerian (*Centranthus ruber*), and Italian thistle (*Carduus pycnocephalus*). Additionally, garland chrysanthemum (*Chrysanthemum coronarium*) has naturalized across much of the grasslands and showy stands of these flowers are present throughout the entire CPSRA.

Small distinct colonies of native perennial bunch grasses grow in a few areas at HPS Phase II. Clusters of single species or a combination of species including purple needle grass (*Nassella pulchra*), blue wild rye (*Elymus glaucus*), and red fescue (*Festuca rubra*) grow sporadically throughout the Project site. These small isolated occurrences of native grasses are not large enough to warrant identification as a separate vegetation community.

Portions of the Study Area, including uplands along Yosemite Slough, include ruderal vegetation such as fennel (*Foeniculum vulgare*) intermixed with non-native grasses such as wild oats and Italian rye (*Lolium multiflorum*). Shrubs, mainly coyote brush (*Baccharis pilularis*), are scattered throughout the upland surrounding Yosemite Slough area.



SOURCE: Caltrans, Biological Assessment for the Bayview Transportation Improvements Project, Jones and Stokes, July 2007. Golden Gate Audubon Society, Final Report Yosemite Slough Watershed Wildlife Survey, H.T. Harvey & Associates, Hunters Point Shipyard and Candlestick Point State Recreation Areas Final Delineation of Wetlands and other Waters, February 2009 and revised July 2009. LSA, July 2004, PBS&J Field Survey, August 2007 and May 2008, Merkel and Associates, 2003 SF Bay eelgrass survey.

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FIGURE III.N-2

Candlestick Point — Hunters Point Shipyard Phase II EIR

STUDY AREA HABITATS

Landscaped Areas/Ornamental Plants

Landscaped areas make up about 44.67 acres of Candlestick Point and include areas landscaped with native and non-native ornamental shrubs and trees, particularly near the walking paths along the shoreline of Candlestick Point. A tree survey[661] (provided in Appendix N4) was conducted for the Project within all of the Project site except the portion of CPSRA that is not subject to the land transfer and is not expected to be substantially modified. This survey identified trees primarily in areas mapped as "Landscaped/Ornamental", "Urban", and "Non-Native Annual Grassland" on Figure III.N-2. For the purpose of this survey, a "tree" was defined as any stem of a woody plant with a tree-like (as opposed to shrubby) growth habit measuring at least 2 inches in diameter at a height of 4.5 feet above the ground. As a result, single trees with multiple stems measuring at least 2 inches in diameter were represented as multiple "trees," and the high number of trees recorded during this survey was driven largely by such multi-stemmed individuals. The tree survey recorded approximately 1,976 tree stems at least 2 inches in diameter on 1,068 individual plants on Candlestick Point and 854 tree stems at least 2 inches in diameter on 328 individual plants on HPS Phase II.

On Candlestick Point, the vast majority of these trees consisted of multi-stemmed lollypop trees (*Myoporum laetum*); eucalyptus (*Eucalyptus* spp.), pines (*Pinus* spp.), and olives (*Olea europeaea*) were also well represented on Candlestick Point. All four of these species are non-natives. The most common native trees on Candlestick Point are California live oak (*Quercus agrifolia*), flannel bush (*Fremontodendron californicum*), and California buckeye (*Aesculus californica*). Monterey pine (*Pinus radiata*) and ornamental cypress (*Cupressus* spp.) are also common, although neither is native to San Francisco. There are several specimens of the native California bay (*Umbellularia californica*) and blue elderberry (*Sambucus nigra* ssp. *caerulea*) as well. Non-native, ornamental lollypop trees (*Myoporum laetum*) grow along the northwestern edge of Candlestick Point, and Australian tea trees (*Leptospermum laevigatum*) are scattered along the trails of the CPSRA. Native shrubs include coyote bush, ornamental buckbrush (*Ceanothus* spp.), firethorn (*Pyracantha* spp.), coffeeberry (*Rhamnus californica*), hummingbird sage (*Salvia spathacea*), and black sage (*S. mellifera*) which grow along the paths in clusters that are a combination of planted and volunteer specimens. Non-native evergreen shrubs such as rockrose (*Cistus* spp.) are common throughout the Project site and in some locations have naturalized.[662]

On HPS Phase II, trees recorded during the tree survey were dominated by small, multi-stemmed toyon (*Heteromeles arbutifolia*; a native species, though the trees on HPS appear to be of an ornamental variety) and several non-natives, including London planetree (*Platanus* x *acerifolia*) and acacia (*Acacia* spp.).

Salt Marsh

Salt marsh habitat forms along the margins of estuaries and bays whose shorelines are shallow and protected. In the Study Area, it totals approximately 4.50 acres on site and 0.05 acre in areas of off-site (i.e., areas of Yosemite Slough outside of the Project boundary) Project work.[663] It occurs in limited areas along the shoreline where riprap does not extend to the waterline and prohibit the growth of vegetation, and in several nontidal areas in the southwestern portion of HPS. Narrow patches of salt marsh habitat, varying

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661 H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.
662 Naturalized plants are those that were originally installed as ornamental plantings but are now found growing 'naturally' in a variety of habitats.
663 H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

in length from 20 to 100 feet, occur sporadically along the shoreline of the Project site, and throughout Yosemite Slough.[664]

Salt marshes are often subject to tidal influences, and species composition of tidal salt marsh vegetation varies along gradients based on elevation. The amount of time an area is inundated determines the primary species of plants found there. The highest elevations typically support almost pure stands of pickleweed (*Salicornia virginica*), which also dominates the patches of nontidal salt marsh on HPS. Associated species that occur in the zone around the high tide elevation include salt grass (*Distichlis spicata*), European sea rocket (*Cakile maritima*), coastal gumweed (*Grindelia stricta*), and sea lavender (*Limonium californicum*). Slightly lower areas above the Mean High Water (MHW) elevation support cord grass (*Spartina* spp.). In the area above the HTL, common iceplant (*Carpobrotus edulis*) grows in some locations, carpeting the upland margins in a dense monoculture. The low growing shrub silver beach bur (*Ambrosia chamissonis*) also grows in the upland areas along the shoreline.

Seasonal Freshwater Wetland

Seasonal freshwater wetland habitat occupies 0.20 acre in two linear features at the southern and west-central margins of HPS Phase II. These wetlands are characterized by the presence of annual wetland grasses and forbs in depressions that hold water for a short to medium duration during the rainy season. One of these wetlands, in the southwestern portion of HPS Phase II, consists of pools that are shallow basins that lack drainage outlets. Seasonal water inundation in these pools creates a condition favoring hydrophytic (water-loving) plants such as spearscale (*Atriplex triangularis*), salt grass, bird's-foot trefoil (*Lotus corniculatus*), prickly ox-tongue (*Picris echioides*), saltmarsh bulrush (*Bolboschoenus robustus*), Italian ryegrass (*Lolium multiflorum*), rabbit's foot grass (*Polypogon monspeliensis*), and willow dock (*Rumex salicifolius*), as observed in HPS Phase II.[665] The second seasonal freshwater wetland, in the west-central part of HPS Phase II, consists of a narrow swale/ditch that is apparently fed by groundwater seepage.

Common Aquatic Habitats

Mud Flats

Mud flats are the broad expanses of the San Francisco Bay bottom that are exposed during low tides. These areas are comprised of very soft sediments and do not support any vegetation other than eelgrass beds, which may occur within mud flats. Mud flats are an important habitat because they support a vast array of crustaceans, worms, and other invertebrates that are important food sources for resident and migratory shorebirds and waterfowl. Mud flats are exposed at low tides once or twice a day along the shore south of CPSRA and along the shorelines of Yosemite Slough and South Basin. These mud flats are relatively limited in extent compared to the vast mud flats present in other parts of San Francisco Bay, and as a result, numbers of shorebirds using these mud flats are low except for occasional, brief migratory pulses of birds.

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[664] H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.
[665] PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report*, Prepared for San Francisco Redevelopment Agency and San Francisco Planning Department, 2009, which is provided as Appendix N1 to this EIR.

Open Water (San Francisco Bay)

San Francisco Bay (also referred to as "the Bay" in this section) is the largest estuary on the California Coast, covering between 400 and 1,600 square miles depending on which bays are included.[666] Fresh water enters primarily through the Sacramento-San Joaquin Delta and mixes with seawater that enters via the Golden Gate. Tidal action and freshwater runoff determine the salinity of the Bay. For the purpose of this assessment, the term "open water" refers to unvegetated tidal areas located below the MHW elevation, which in this area is approximately 5.87 feet relative to the North American Vertical Datum of 1988 (NAVD88)[667] or 11.80 relative to the San Francisco City Datum (SFCD).[668] This is the same area regulated by the USACE under Section 10 of the *Rivers and Harbors Act*. These areas are subject to the normal ebb and flood of the tide. For example, mud flat habitats described above are a subset of open water aquatic habitats since these areas are inundated for at least half the tidal cycle; for this reason, acreages of mud flat and open water habitats are not distinguished in Table III.N-1. Open water habitats support an array of relatively common estuarine/marine species from encrusting tunicates, sponges, and algae to bottom-dwelling fish such as the Pacific halibut (*Hippoglossus stenolepis*), flounder, and sole, to more open water fish such as the Pacific herring (*Clupea pallasi*), Pacific sardine (*Sardinops sagax*), and anchovies (*Anchoa* spp.). The on-site open waters are those nearshore areas below the MHW elevation where Project work could occur (i.e., sea wall enhancements and marina improvements). Off-site open waters within a 5-mile radius of the Project site were also considered for their potential to support sensitive species (as described under "Sensitive Species and Habitats" below). These areas are considered here because most of the sensitive species potentially occurring there have the ability to move to and from the Study Area at any time.

Eelgrass Beds

Eelgrass is an aquatic plant found on soft mud-bottom bays and estuaries along the Pacific coast. It occurs in both subtidal and intertidal areas of San Francisco Bay and approximately 1.99 acres of it occur within the Study Area.[669] Eelgrass beds are considered a sensitive resource and, therefore, are discussed in detail under Sensitive Species and Habitats.[670]

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666 The Bay Institute, *About the Bay*. 2008. Website: http://www.bay.org/about_the_bay.htm. Accessed October 28, 2008.

667 H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

668 San Francisco City Datum (SFCD) is a local vertical geodetic reference system specific to the City and County of San Francisco and formally established in 1964 as 8.616 feet above the National Geodetic Vertical Datum of 1929 (NGVD29), making it about 8.13 feet above mean sea level. The North American Vertical Datum was established in 1988 (NAVD88) and generally has replaced NGVD29 as a standard reference. Elevations expressed in NGVD29 may be converted to NAVD88 by adding 2.69 feet.

669 California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database,* Wildlife and Habitat Data Analysis Branch, Sacramento, California, September 2003 edition.

670 California Department of Fish and Game (CDFG), *The Vegetation Classification and Mapping Program: List of Terrestrial Natural Communities Recognized by the California Natural Diversity Database,* Wildlife and Habitat Data Analysis Branch, Sacramento, California, September 2003 edition.

Common Wildlife

Invertebrates

Fourteen butterfly species were observed during the Yosemite Slough Watershed Wildlife Survey.[671] Common butterflies observed during that survey included cabbage whites (*Pieris rapae*), anise swallowtails (*Papilio zelicaon*), and common checkered skippers (*Pyrgus communis*). Other butterflies observed include mustard white (*Pieris napi*), orange sulphur (*Colias eurytheme*), California hairstreak (*Satyrium californicum*), gray hairstreak (*Strymon melinus*), western pygmy-blue (*Brephidium exile*), spring azure (*Celastrina ladon*), west coast lady (*Vanessa annabella*), red admiral (*Vanessa atalanta*), common buckeye (*Junonia coenia*), and common ringlet (*Coenonympha tullia*), and monarch butterfly (*Danaus plexippus*). Numerous other invertebrate species, including insects, crustaceans, worms, and other taxa, occur on the site as well.

Reptiles and Amphibians

The Yosemite Slough Watershed Wildlife Survey recorded three snake species, two lizard species, and one amphibian.[672] Reptiles and amphibians observed included California slender salamander (*Batrachoseps attenuatus*), southern alligator lizard (*Elgaria multicarinata*), western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), ring-necked snake (*Diadophis punctatus*), and western garter snake (*Thamnophis elegans*). The western fence lizard, California slender salamander, and southern alligator lizard were found in relatively high numbers, with survey maxima (i.e., the maximum number of individuals observed on a single survey) of 49, 43, and 21 individuals, respectively. However, the other species were represented by few individuals, suggesting that populations of these other species are sparse in the area.

Amphibians had the lowest diversity within the Yosemite Slough Watershed Survey area, with only one species observed (the California slender salamander).[673] The California slender salamander frequents grassland, chaparral, woodland, forest, and yards and vacant lots in some suburban areas. It takes refuge under logs, boards, bark, and in damp leaf litter and rotting logs. It lays its eggs in late fall and winter, often in communal nests.[674] The San Francisco Bay and the small seasonal wetlands on the site do not provide suitable aquatic habitat for amphibians, primarily due to high salinity. The few freshwater habitats on or near the Project site do not provide breeding habitat for amphibians such as frogs or toads, likely because of their very shallow and/or ephemeral nature.[675]

Reptiles also appeared to have relatively low diversity, with only five species observed. The abandoned fields, extensive debris (providing cover), and presence of prey (i.e., mice, invertebrates, salamanders) provide suitable habitat for these five species.[676] The upland areas, dominated by disturbed vegetation and non-native grassland, support the snake and lizard species.[677]

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671 Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
672 Ibid.
673 Ibid.
674 Stebbins, R., Peterson, *Field Guides: Western Reptiles and Amphibians*, Houghton Mifflin Company, 1966.
675 Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
676 Ibid.
677 Ibid.

During one survey, 21 southern alligator lizards were observed in silvery beachweed along the shoreline of the South Basin (refer to Map 2 of the Yosemite Slough Watershed Wildlife Survey for a graphic representation of the location of the South Basin).[678] The lizards were all juveniles and may have been from a single clutch that had been laid in the silvery beachweed.[679]

Although the Yosemite Slough Watershed Wildlife Survey covered only Candlestick Point and the southern shoreline of HPS Phase II, it is expected that a lower abundance of these common reptile and amphibian species would be found within the disturbed areas within HPS Phase II than at Candlestick Point. Recent, intensive disturbance due to ongoing remediation activities has undoubtedly reduced populations of these species on HPS Phase II. A few individuals of these reptiles and amphibians may occur within the developed portions of the Project site, which represents approximately 80 percent of the overall acreage of the site, but numbers are expected to be very low in such low-quality habitat.

Birds

One hundred and eighteen bird species (which are named herein according to the American Ornithologists' Union Checklist of North American Birds[680] except for sensitive subspecies recognized by CDFG or USFWS) were observed during the Yosemite Slough Watershed Wildlife Survey.[681] Of these, 51 species were represented by a maximum count of five or fewer individuals, indicating that, for many bird species, the site is used by relatively low numbers of individuals.[682] The majority of the species observed were terrestrial species, followed by shorebirds, waterfowl, gulls and terns, and raptors (in descending order). Terrestrial habitats supported large numbers of some common bird species such as white-crowned sparrows (*Zonotrichia leucophrys*), western meadowlarks (*Sturnella neglecta*), and house finches (*Carpodacus mexicanus*). The landbirds that are most abundant on the site are those associated with the weedy, ruderal habitats dominating the Project site and those tolerant of the urbanization and associated disturbance resulting from the site's location. In contrast, very few Neotropical and other long-distance migrant songbirds were recorded during this study. Studies have documented that bird species diversity is closely associated with structural habitat complexity. Bird species diversity (a measure of the number of species in a given area) increases with increasing foliage height diversity (a measure of the number and diversity of vertical layers of vegetation in that area).[683,684] While this has been best studied in breeding birds, the structural complexity of habitat also influences the degree to which an area provides resources to migrant birds. Multi-layered vegetation, with well-developed ground, understory, and canopy layers, would support greater diversity of migrants than the structurally simple vegetation that dominates most of Candlestick Point and HPS Phase II. Also, breeding bird abundance is often closely associated with the density or volume of vegetation, with increasingly dense vegetation supporting more individual birds[685]. The sparse

678 Ibid.
679 Ibid.
680 American Ornithologists' Union (AOU), *Check-list of North American Birds (1998)* through Forty-ninth Supplement, July 2008.
681 Ibid.
682 Ibid.
683 MacArthur, R. H. and J. W. MacArthur. 1961. On bird species diversity. Ecology 42:594-598.
684 Karr, J. R. 1968. Habitat and avian diversity on strip-mined land in east-central Illinois. Condor 70:348-357.
685 Mills, G. S., J. B. Dunning, Jr., and J. M. Bates. 1991. The relationship between breeding bird density and vegetation volume. Wilson Bulletin 103:468-479.

vegetation present on most of the Project site limits the value of the site to breeding and migratory birds. Numbers and diversity of landbirds on HPS Phase II are likely lower than on Candlestick Point owing to the recent, intensive disturbance and even lower abundance of trees and shrubs on HPS Phase II.

The waters of the South Basin and the Bay surrounding the Study Area are used by a variety of waterbirds, some of which are fairly abundant. Common waterbirds observed in these waters include double-crested cormorant (*Phalacrocorax auritus*), California gull (*Larus californicus*), greater scaup (*Aythya affinis*), ruddy duck (*Oxyura jamaicensis*), surf scoter (*Melanitta perspicillata*), and bufflehead (*Bucephala albeola*). While these birds forage primarily or solely in aquatic habitats, some species, such as cormorants, California brown pelicans (*Pelecanus occidentalis californicus*), gulls, and possibly terns roost in large numbers on piers on HPS Phase II. Small numbers (fewer than 10 pairs) of western gulls (*Larus occidentalis*) nest on two rocks in South Basin known as Double Rock. Shorebirds such as the western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), and dunlin (*Calidris alpina*) forage on intertidal mud flats and along the shoreline of Candlestick Point and the southern part of HPS Phase II, typically in low numbers but occasionally in higher numbers when migratory pulses of shorebirds are present in the Bay. The majority of the Study Area is developed or urbanized and supports relatively few species of birds.

In addition to the 118 bird species recorded during the Yosemite Slough Watershed Wildlife Survey, that survey's report listed an additional 36 species that had been recorded by a local birder, Mr. Alan Hopkins, over the past 20 years.[686]

Mammals

The most abundant mammal observed during the Yosemite Slough Watershed Wildlife Survey was the California ground squirrel (*Spermophilus beecheyi*). This species was observed along the shoreline and riprap areas of HPS Phase II and Candlestick Point, as well as in grassland and ruderal habitats and under trees and shrubs on Candlestick Point. The substrate along the shoreline is composed mostly of small rubble such as broken bricks that had been used as fill. Riprap composed of large rocks was placed along exposed sections of the shoreline, providing refugia for small mammals.[687] Other mammals observed during the survey included feral domestic cat (*Felis silvestris*), feral domestic dog (*Canis familiaris*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), harbor seal (*Phoca vitulina*), black-tailed jackrabbit (*Lepus californicus*), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), and Norway rat (*Rattus norvegicus*). Of the 10 species recorded by the LSA study, three are non-natives (domestic dog, domestic cat, and Norway rat); two are common urban-adapted species (raccoon and striped skunk); and one occurs infrequently in aquatic areas (harbor seal). Of the remaining four species, the Botta's pocket gopher and California vole were represented by no more than one individual on a given survey and thus may be uncommon on the site. As mentioned for reptiles and amphibians above, mammal diversity and abundance on HPS Phase II are expected to be lower than on Candlestick Point, as recent, intensive disturbance by remediation activities has likely reduced mammal populations there. The shorelines, vacant lots, and undeveloped ruderal/non-native grassland areas of HPS Phase II and CPSRA are surrounded by urban and industrial

[686] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[687] Ibid.

development, which limits the potential for dispersal of mammals in and out of the site. There are no CNDDB reports of the occurrence of any special-status mammal species in the Study Area.

Common Aquatic Resources

Fish, Crabs, and Mollusks

San Francisco Bay supports a diverse assemblage of fish species. These vary from resident fish such as assorted flat fish (flounder and sole) to a variety of rockfish (*Sebastes* spp.) and to migratory species such as Pacific herring, Pacific sardines, anchovies, and salmonids (*Oncorhynchus* spp.) which spend varying portions of their life cycle in the Bay. Estuaries provide important spawning habitat for fish and the San Francisco Bay is no exception. Pacific herring spawn in the Bay and support a small commercial fishery. Other fish for which adults spawn in the Bay include flounder, sole, and Pacific halibut. Juvenile sturgeon (*Acipenser* spp.) rear in the Bay for an undetermined length of time before moving to the ocean.

Shellfish found in the Bay and within the vicinity of the Study Area include Dungeness crab (*Cancer magister*), other rock crab, and shrimp. Dungeness are the target of an important commercial fishery in the open ocean and the Bay is important rearing habitat for young crab. Crab hatch in the Gulf of the Farallones and after several larval stages, migrate into the Bay and rear primarily in San Pablo and Suisun bays,[688] over 20 miles north of the Study Area.

The Bay also supports a variety of mollusks. These include native clams, mussels, oysters, and snails (gastropods). Some of these are native (i.e., bent-nosed macoma [*Macoma nasuta*], Olympia oyster [*Ostrea conchaphila*], and limpets [*Acmaea* spp.]) while others have been introduced either intentionally such as the Atlantic oyster (*Crassostrea virginica*) or unintentionally such as overbite clam (a.k.a. Asian clam; *Corbula amurensis*). Many of the clams use soft-bottom sediments and could be found on the seafloor near the Project site. Most oysters require a solid substrate for attachment. Suitable habitat for oysters and mussels is found throughout the Study Area on bulkheads, pilings, and riprap associated with the shoreline.

In addition to the native fish and shellfish, the Bay supports a vast array of introduced species. Most of these have been introduced in ballast water of trans-Pacific traveling cargo ships. Species suspected of being ballast water introductions include Chinese mitten crab (*Eriocheir sinensis*), yellowfin goby (*Acanthogobius flavimanus*), and overbite clam. Other species, including striped bass (*Morone saxatilis*) and American shad (*Alosa sapidissima*), have been introduced to support sport fisheries. The complex interaction between introduced and native species within the Bay continues to be the topic of much debate and study.

The open water of the Study Area is part of or directly connected to the Bay and all of the Bay fish species can move freely into and out of the Study Area at any time. Because of this, the species assemblage within and adjacent to the Project site is expected to be representative of the central Bay as a whole.

The portion of the San Francisco Bay immediately adjacent to the Project site has been highly modified over the years to support commercial shipping, industrial uses, and US Naval activities, and virtually the entire shoreline of the Study Area is composed of fill of various kinds. As a result, the shorelines are almost

[688] California Department of Fish and Game (CDFG), 2009. Dungeness crabs (*Cancer magister*). Website: http://www.delta.dfg.ca.gov/baydelta/monitoring/cmag.asp. Accessed July 16, 2009.

exclusively comprised of bulkheads and riprap. Dredging of shipping channels has occurred within the nearshore areas. All of these actions have combined to reduce the aquatic habitat complexity. Reductions in habitat complexity reduce the number of species that routinely utilize a particular area,[689] and, therefore, the numbers of resident fish species within the Study Area are expected to be similar to other developed areas of the Bay.

Marine Mammals

The most common marine mammals within San Francisco Bay are harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*), both of which are protected under the *Marine Mammal Protection Act*. The *Marine Mammal Protection Act* does not bestow a particular status designation for the species it protects, which is similar to the *Migratory Bird Treaty Act*. Instead, the *Marine Mammal Protection Act* and the *Migratory Bird Treaty Act* equally protect all marine mammals and native birds, respectively.

Harbor Seal (*Phoca vitulina*)

Harbor seals are year-round residents found throughout the Bay. They use haulouts scattered through the Bay to bask, rest, and use as pupping sites. The most frequently used pupping sites are in the North (Castro Rocks) and South bays (Mowry Slough); both sites are over 15 miles from the Study Area. Pupping season begins in late March and peaks in early May.[690] The closest haulout site is on Yerba Buena Island, about 6 miles from the Project site.[691] There are no known haulout locations within the Study Area. During the 2003–2004 Yosemite Slough Watershed Wildlife Survey, LSA observed nine harbor seals in the outer South Basin (open water between Candlestick Point and HPS Phase II); however, no haulouts were detected during the survey.[692] No harbor seals or haulouts were observed during surveys by PBS&J biologists for this Project.

California Sea Lion (*Zalophus californianus*)

California sea lions do not breed in the Bay, preferring offshore islands such as the Channel Islands near Santa Barbara or the Farallon Islands, but sea lions forage and rest at various locations around the San Francisco Peninsula.[693] They are relatively social animals, frequently seen basking or foraging in large groups. On May 2, 2003, a total of ten sea lions were observed hauled out on a flat, floating structure in the outer South Basin.[694] Sea lions may occur in the Study Area, but the site does not support any known haulout locations.

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689 Moyle, P.B. *Inland Fishes of California, 2nd Edition*, University of California Press.
690 Richmond Bay Bridge Harbor Seal Team. No date. Harbor Seal. Website:
http://userwww.sfsu.edu/~halmark/educati.htm. Accessed October 31, 2008.
691 San Francisco State University. No date. *Richmond Bridge Harbor Seal Survey Site Map*. Website:
http://userwww.sfsu.edu/~halmark/map.htm. Accessed October 31, 2008.
692 Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.
693 Marine Mammal Center 2002. *California Sea Lion information sheet*. Website:
http://www.marinemammalcenter.org/learning/education/pinnipeds/casealion.asp. Accessed October 31, 2008.
694 Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

Sensitive Species and Habitats

The potential for special-status plant and wildlife species to occur within the Study Area was determined by assessing habitat suitability information collected during biological reconnaissance surveys conducted in August 2007 and July 2008, a rare plant survey conducted in May 2008, and a review of the CNDDB, CNPS Inventories, and USFWS databases, as previously described. In addition, approximately 29 wildlife surveys were conducted in the vicinity of Yosemite Slough between January 2003 and April 2004 (in association with the Yosemite Slough Watershed Wildlife Survey), and that survey's report included a list of additional bird species that had been observed by Mr. Alan Hopkins over the past 20 years.[695] The list of potentially occurring special-status species provided in Table III.N-5 (Special-Status Species Potentially Occurring within the Study Area) is informed by all of these sources, as well as a search of known sensitive species occurrences within a 5-mile radius of the Project site, as shown in Figure 3 (Special-Status Species Occurrences within 5-Mile Radius) in Appendix N1 to this EIR. *(Note: Table III.N-5 is provided at the end of this section due to its length.)*

Special-status species are defined as follows:

- Species listed, proposed, or candidate for listing as Threatened or Endangered by the USFWS pursuant to the federal *Endangered Species Act of 1973* (FESA), as amended
- Species designated by the USFWS as Species of Conservation Concern
- Species designated by the National Marine Fisheries Service (NMFS) as Species of Special Concern
- Species listed as Rare, Threatened, or Endangered by the CDFG pursuant to the *California Endangered Species Act of 1984* (CESA), as amended
- Species designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians) of the *California Fish and Game Code*
- Species designated by the CDFG as California Species of Special Concern
- Plant species listed as Category 1B and 2 by the CNPS; CNPS Category 3 and 4 species were not considered special-status species for the sake of this assessment, as they are not considered sufficiently rare on a regional level to warrant such status, though no such plants were recorded in the Study Area.
- Species not currently protected by statute or regulation, but considered rare, threatened or endangered under Section 15380 of the CEQA Guidelines (such as the Olympia oyster and Pacific herring)

Table III.N-5 identifies the special-status plant and wildlife species that have been recorded or could occur within five miles of the Study Area, along with a description of their habitat requirements, protection status, and a brief description of each species' likelihood to be present within the Study Area. Several species known to occur within five miles of the Study Area and listed in Table III.N-5 were determined not likely to occur or to be absent from the Study Area because (1) the site lacks suitable habitat or is outside of the species' range and, (2) no instances of such species were observed during any of the field surveys (these species are further discussed in the *Bayview Waterfront Project Biological Technical Report*, which is provided as

[695] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

Appendix N1 to this EIR[696]). Consequently, the detailed species' discussions and impact analysis in this EIR section address only those species in Table III.N-5 that have a "Low" or better probability to occur within the Study Area. Those species or habitats with a "Not Likely" or "Absent" likelihood of occurrence in Table III.N-5 are not addressed further because they are not expected to occur on the Study Area or be affected by Project implementation.

Sensitive Plants

The USFWS, CNDDB, and CNPS reported 41 special-status plant species as potentially occurring within the US Geological Survey's 7.5-minute San Francisco South and Hunters Point quadrangles (refer to Table 2 [Special-Status Species Potentially Occurring within the Vicinity of the Bayview Waterfront Project] in Appendix N1 to this EIR).

The Study Area is largely developed and most vegetation in the area was introduced as landscape plants and turf grass. Much of the Study Area, including virtually all of CPSRA, is located on Bay fill. Ruderal (disturbed) habitats and ornamental landscaping predominate in those portions that are not landscaped. Jones & Stokes conducted botanical habitat assessments of the Candlestick Point and HPS on October 29, 2004; March 1, 2006; October 6, 2006; and May 17, 2007.[697] PBS&J botanists conducted rare plant surveys for the Candlestick Point area in May 2008. The general absence of suitable habitat over a majority of the Study Area in conjunction with the absence of observed special-status plants, either as observed during focused surveys or cited in CNDDB species accounts, supports the conclusion that no sensitive plant species occur within the Study Area.

Sensitive Vegetation Communities and Habitats

Waters of the United States and Navigable Waters

The Study Area contains several categories of jurisdictional waters of the United States, including jurisdictional wetlands that are subject to Section 404 of the *Clean Water Act* (Section 404). The types of wetlands include salt marsh and seasonal freshwater wetlands. In addition, the Study Area also contains open waters of the San Francisco Bay, which are subject to both Section 404 of the *Clean Water Act* and Section 10 of the *Rivers and Harbors Act of 1899* (Section 10). Section 404 regulates the placement of fill into any "waters of the United States." Waters of the United States are broadly defined to include navigable waterways, their tributaries, lakes, ponds, and wetlands, including tidal waters and wetlands from the HTL seaward. Section 10 regulates the placement of fill into navigable waters of the United States, including tidal waters from the MHW elevation seaward. Section 10 waters are a subset of Section 404 waters, and are therefore not described separately for purposes of this EIR. A more detailed discussion of the requirements of Section 404 and Section 10 is provided in Section III.N.3 (Regulatory Framework).

A wetland delineation was conducted by H.T. Harvey & Associates for the Study Area that distinguished jurisdictional wetlands and other waters of the United States subject to Section 404.[698] The revised H.T.

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[696] PBS&J, *Candlestick Point/Hunters Point Shipyard Project Biological Technical Report,* prepared for the San Francisco Redevelopment Agency, San Francisco Planning Department, December 11, 2008 updated November 2, 2009.
[697] Jones and Stokes, *Natural Environmental Study Report for the Bayview Transportation Improvements Project*, June 2009.
[698] H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters,* San Francisco, California, February 2009 and revised July 13, 2009 and October 13, 2009.

Harvey & Associates wetland delineation was submitted to the USACE in July 2009 and was verified in August 2009. The study area for that delineation included the Project site and the off-site areas where Project activities would occur (Figure III.N-3 [Wetlands and Other Waters]). As indicated on Figure III.N-3, the study area for H.T. Harvey's original wetland delineation did not included several limited areas that are now considered part of the Project site. As a result, H.T. Harvey expanded its original delineation by inspecting these additional areas in the field on October 8, 2009. H.T. Harvey & Associates has amended its wetland delineation report, and verification of jurisdictional boundaries in these additional areas by the USACE is pending.

According to USACE regulations and guidance, other waters may include lakes, seasonal ponds, channels, tributary waters, non-wetland linear drainages, and seasonal springs. Such areas are identified by the (seasonal or perennial) presence of standing or running water and generally lack hydrophytic vegetation.

In tidal waters, Section 404 other waters extend to the landward extent of vegetation associated with salt or brackish water or the HTL. The HTL is defined as the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The HTL may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gauges, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. Confirmation of this definition and approach used by the San Francisco District of the USACE in determining the MHW and HTL locations was obtained from the Regulatory Branch of the USACE on January 29, 2009.[699] The HTL represents the upper limit of Section 404 other waters and is approximately 1.5 to 2 vertical feet above the MHW mark.[700]

Table III.N-2 (Wetlands and Other Waters of the United States [Section 404] within the Study Area) presents the acreage of waters of the United States (including jurisdictional wetlands) that were delineated for the Study Area. The acreages of jurisdictional wetlands and waters identified in Table III.N-2 include the HT Harvey study area boundary as identified in Figure III.N-3 (which includes open waters adjacent to Candlestick Point and HPS Phase II), as well as off-site areas of Yosemite Slough that are located outside of this boundary.

[699] Ibid.
[700] Ibid.



SOURCE: HT Harvey, 2009; Moffat & Nichol, 2009; PBS&J, 2009.

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FIGURE III.N-3

Candlestick Point — Hunters Point Shipyard Phase II EIR

WETLANDS AND OTHER WATERS

Table III.N-2 Wetlands and Other Waters of the United States (Section 404) within the Study Area

Jurisdictional Feature (Waters of the United States)	Area		Yosemite Slough		
	Candlestick Point	Hunters Point Shipyard	On Site	Off Site	Total Acreage
Freshwater Wetland	—	0.20	—	—	0.20
Non-tidal Salt Marsh	—	1.81	—	—	1.81
Tidal Salt Marsh	0.93	1.75	0.01	0.05	2.74
"Other 404 Waters"	21.82	169.29	1.66	2.77	195.54
Totals for Section 404 Wetlands and Waters of the US	***22.75***	***173.05***	***1.67***	***2.82***	***200.29***

SOURCE: H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California*, February 2009 and revised July 13, 2009 and October 13, 2009.

a. Total equals sum of Freshwater Wetland, Non-tidal Salt Marsh, Tidal Salt Marsh, and Other 404 Waters

b. On-site areas within Yosemite Slough refer to areas within the Study Area. Off-site areas within Yosemite Slough are those areas adjacent to the slough that are outside of the Study Area boundary.

Eelgrass Beds

Eelgrass occurs in both subtidal and intertidal areas of San Francisco Bay. The distribution of eelgrass has been mapped relatively recently (in 2003) and the results of this effort indicate that low-density eelgrass beds are found on the north side of Hunters Point peninsula offshore from the end of Earl Street and in a small patch in the South Basin.[701] Eelgrass beds form areas of important habitat for birds, fish, and crustaceans and are one of the preferred spawning habitats of Pacific herring.[702] These plants also support grazing crustaceans, shrimp, and amphipods. Because it requires light for photosynthesis, eelgrass is limited by water clarity to depths of about 6 feet or less. Because little accurate information exists about the historic distribution of eelgrass beds, and because of their current relative scarcity and importance in the overall ecology of the Bay, both the USACE and CDFG consider eelgrass beds a sensitive resource.

Sensitive Wildlife

Invertebrates

*Monarch Butterfly (*Danaus plexippus*)*

Monarch butterflies are common and widespread in California, including the San Francisco Bay area. However, because they tend to gather in winter roosting sites along the California coast in relatively few locations, roost sites that are used traditionally by large numbers of individuals are considered sensitive biological resources and, thus, this common butterfly is discussed here as a sensitive species. Wintering sites in California are associated with wind-protected groves of large trees (primarily eucalyptus or pine) with nectar and water sources nearby, generally near the coast.

[701] San Francisco Bay Eelgrass Inventory, June-October 2003. Prepared for Caltrans and NOAA Fisheries. Prepared by Merkel and Associates, 2003.

[702] Wyllie-Echeverria, S. and M. Fonseca. Eelgrass (*Zostera marina*) research in San Francisco Bay, California from 1920 to the Present. 2003.

A total of seven monarch butterflies were observed during the Yosemite Slough Watershed Wildlife Survey.[703] Ms. Mia Monroe, a Ranger with the Muir Woods National Monument (US National Parks Service) and co-coordinator of the Monarch Campaign for the past 15 years, was contacted in July 2008 and July 2009 to inquire about any known monarch wintering roosts that occur in the Project site. Ms. Monroe consulted with local monarch butterfly specialists and the Monarch Campaign Thanksgiving counts. The Monarch Campaign conducts surveys for peak monarch butterfly wintering population around the Thanksgiving holiday. Ms. Monroe reported there are no records of monarch butterfly autumnal (i.e., temporary bivouac site) nor over-wintering use of the Project site in the CNDDB or reported in other records, including anecdotal observations. The nearest observations of monarch butterfly roosts are at Fort Mason, the Presidio of San Francisco, and Stern Grove.[704]

Using the likelihood of occurrence definitions provided in Table III.N-5, although individual monarch butterflies were observed, the sensitive winter roosting habitat is "not likely" to occur within the Study Area.

Birds

While the CNDDB reports no occurrences of any special-status bird species in the Study Area, special-status bird species have been recorded in the Study Area during the Yosemite Slough Watershed Wildlife Survey and by Alan Hopkins, as documented in that survey's report. Special-status bird species with potential to occur on the site are described below and are also summarized in Table III.N-5. Although the harlequin duck (*Histrionicus histrionicus*), Barrow's goldeneye (*Bucephala islandica*), common loon (*Gavia immer*), yellow warbler (*Dendroica petechia*) and Vaux's swift (*Chaetua vauxi*) have all been observed within the site, these species are considered California Species of Special Concern only when breeding. [705] As they only occur within the site as non-breeders, none of them are discussed below, as they would be present only when they would not be considered Species of Concern.

*Alameda Song Sparrow (*Melospiza melodia pusillula*)*

The Alameda song sparrow is a CDFG Species of Special Concern. The Alameda song sparrow occurs only in the marshlands of the southern San Francisco Bay Region.[706] The primary range of the Alameda song sparrow extends from Coyote Creek, at the southern extremity of the Bay, northward along the west shore of South San Francisco Bay to Belmont Slough (south of the Study Area) and along the east shore to San Lorenzo. Song sparrows nest in dense riparian thickets, emergent wetlands (including salt marshes), and dense thickets of other vegetation.[707] The Alameda song sparrow uses tidal salt marsh habitats along the edge of the Bay and streams where tidal flow affects the vegetation. Candlestick Point and HPS Phase II provide potential habitat for this species in salt marshes along the shoreline, but due to the very narrow nature of tidal salt marsh in the Study Area, such habitat is marginal at best for this species. Song sparrows were observed

[703] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[704] Monroe, M., Ranger, Muir Woods National Monument, telephone conversation with Todd Wong, PBS&J, July 16, 2008 and July 20, 2009.
[705] California Department of Fish and Game (CDFG). Electronic file: http://www.dfg.ca.gov/wildlife/nongame/ssc/birds.html, accessed on July 30, 2009.
[706] Walton, B., 1974. *Salt Marsh Song Sparrow Study.* California Department of Fish and Game (CDFG), 1974. Available at: http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=4696. Accessed July 21, 2008.
[707] Madrone Audubon Society, *Sonoma County Breeding Bird Atlas*, 1995.

between January 2003 and April 2004 along Yosemite Slough, but the observed sparrows may or may not be Alameda song sparrows.[708] Observations in April may be of breeding birds although nesting has not been documented. Given the marginal quality of habitat on the site, the site's isolation from more extensive marshes that may serve as source populations for Alameda song sparrows, and the sedentary nature of Alameda song sparrows, it is possible that these are the more widespread race *gouldii* or that they represent migrants or wintering individuals from other races that occur in the region during the non-breeding season. The CNDDB does not report occurrences of Alameda song sparrow in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "low" likelihood to occur within the Study Area.

*American Peregrine Falcon (*Falco peregrinus anatum*)*

The American peregrine falcon is a state-listed endangered species and a CDFG fully protected species pursuant to Section 3511 of the *California Fish and Game Code*; however, the California Fish and Game Commission voted to remove the species from the state endangered species list on August 6, 2009. The bird has experienced a remarkable resurgence in California and other parts of North America. This striking recovery is due in large measure to the ban on the use of DDT (a synthetic pesticide) in many places , including the United States. The peregrine has recovered in North America to the point that the USFWS removed the species from the federal Endangered Species List on August 25, 1999.[709] A pair of American peregrine falcons has nested in the Re-gunning crane on Parcel D of the Shipyard, and has raised several broods at this location over the years.[710] These birds forage widely over the entire Study Area, likely feeding primarily on rock pigeons (*Columba livia*) and waterbirds.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area.

*Bryant's Savannah Sparrow (*Passerculus sandwichensis alaudinus*)*

Bryant's savannah sparrow is a CDFG Species of Special Concern. Bryant's savannah sparrow is a California endemic restricted to a narrow coastal strip from Humboldt Bay south to the Morro Bay; its center of abundance appears to be the San Francisco Bay area.[711] This sparrow occupies low tidally influenced habitats, adjacent ruderal areas, moist grassland within and just above the fog belt, and infrequently, drier grasslands. Adjacent to salt marshes this sparrow also occupies weedy spoil areas, canal banks, and bottomland pastures. In South San Francisco Bay, it nests mainly on levee tops grown to grasses and in areas of high pickleweed on levee banks. Bare ground, whether provided by tidal mud flats or upland interstitial areas between clumps of vegetation, appears to be an important component of occupied habitat. The Study Area provides potential habitat for this species in salt marshes along the shoreline, but because

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[708] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[709] United States Fish and Wildlife Service (USFWS), *Endangered and Threatened Wildlife and Plants; Final Rule To Remove the American Peregrine Falcon From the Federal List of Endangered and Threatened Wildlife, and To Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Conterminous United States*; Final Rule, 64 Federal Register 46542, August 1999.
[710] Nelson, G., Facility Coordinator, Department of the Navy, field visit with PBS&J, July 8, 2008.
[711] California Department of Fish and Game (CDFG). *California Birds Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. 2008.

of the very narrow nature of tidal salt marsh in the Study Area only marginal quality habitat is available. Savannah sparrows were observed between January 2003 and April 2004 along Yosemite Slough, although the observed sparrows may or may not be Bryant's savannah sparrows.[712] Observations in April 2004 may be of breeding birds although nesting has not been documented. Given the marginal quality of habitat on the site and the site's isolation from more extensive marshes that may serve as source populations for savannah sparrows, it is possible that these represent migrants or wintering individuals from other races that occur in the region during the non-breeding season. The CNDDB does not report occurrences of the Bryant's savannah sparrow bird in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "low" likelihood to occur within the Study Area.

*Burrowing Owl (*Athene cunicularia*)*

Burrowing owl, a CDFG Species of Special Concern, is an owl that dwells in generally flat, open, dry grasslands, pastures, deserts, and shrub lands, and in grass, forbs and open-shrub stages of pinyon-juniper and ponderosa pine habitats. Burrowing owls use communal ground squirrel and other small mammal burrows for nesting and cover, as well as artificial structures such as roadside embankments, levees, and berms. They can exhibit high site fidelity, often reusing burrows year after year. Occupancy of suitable burrowing owl habitat by breeding birds can be verified at a site by observation of a pair of burrowing owls during their breeding season (March to August) or, alternatively, by the presence of molted feathers, cast pellets, prey remains (rodents, small reptiles, and large insects), eggshell fragments, or whitewash (guano), at or near a burrow. Burrowing owls are fairly tolerant of human activity near their nest burrows as long as suitable foraging habitat exists nearby. Owl populations have declined sharply in some portions of California during the past two decades (i.e., the San Francisco Bay Area, Sacramento County, San Joaquin County, etc.), but they have increased greatly in some agricultural counties (particularly Imperial). Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the City.[713] The CNDDB does not report occurrences of this species in the area, but burrowing owls have been recorded previously on the site. Historically, they occurred in a rubble pile in the northeastern corner of Candlestick Point, and there have been sporadic sightings of the species in various locations on HPS as well. Breeding is not known to have occurred in the Study Area, and these individuals may all have been migrants and wintering individuals.[714] The frequency of occurrence has apparently declined in recent years, and although suitable breeding, roosting, and foraging habitat is present within the Study Area, the species does not currently breed here and occurs sporadically and in low numbers, at best.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area.

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[712] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[713] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.
[714] Personal Communication between from Alan Hopkins to Steve Rottenborn, July 10, 2009.

*California Brown Pelican (*Pelecanus occidentalis californicus*)*

The California brown pelican is on the verge of recovery. It has been proposed for delisting by the Fish and Game Commission[715] and also recently proposed for delisting under the FESA.[716] It is fully protected by CDFG under Section 3511 of the *California Fish and Game Code*. The California brown pelican is found in estuarine, marine sub-tidal, and marine pelagic (deep) waters along the California coast. Pelicans nest from the Channel Islands of Southern California southward along the Baja California coast and in the Gulf of California to coastal southern Mexico.[717] The pelican builds nests of sticks on the ground, typically on islands or offshore rocks. Post-breeding adults and immature birds are found along the Pacific Coast from Oregon south into Baja, Mexico. This species has been observed perching on piers within HPS Phase II, particularly the three piers in the southeastern corner of HPS Phase II, and it forages within San Francisco Bay; however, the species has never nested as far north as the Bay and nesting habitat for this species is not present in the Study Area. In addition, CNDDB does not report occurrences of California brown pelican communal roosts in the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area.

*Loggerhead Shrike (*Lanius ludovicianus*)*

The loggerhead shrike, a CDFG Species of Special Concern, is a common resident and winter visitor in lowlands and foothills throughout California and prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. It occurs only rarely in heavily urbanized areas, but is often found in open cropland. The *San Francisco Breeding Bird Atlas*, for which field work was conducted in 1991-1993, reported a record of possible breeding in the atlas block that included HPS and referred to a historical breeding record in the atlas block that includes Candlestick Point.[718] Low numbers of loggerhead shrikes have been observed on Candlestick Point and HPS by Alan Hopkins, and non-native grasslands provide suitable foraging habitat and on-site trees provide suitable nesting habitat for this species. However, there is no evidence of confirmed breeding in recent years, and the species currently occurs as an uncommon migrant and winter resident.[719]

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

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[715] California Department of Fish and Game (CDFG) news release: *Fish and Game Commission votes to remove California brown pelican from State Endangered Species List*. February 17, 2009.
[716] United States Fish and Wildlife Service (USFWS), *Endangered and Threatened Wildlife and Plants; Species Account: California Brown Pelican* (*Pelecanus occidentalis californicus*); Classification: Proposed for delisting; Federal Register 73:9407; February 20, 2008.
[717] California Department of Fish and Game (CDFG) B043, *Brown Pelican*. Website*:* http://www.dfg.ca.gov/whdab/html/B043.html. Accessed April 19, 2005.
[718] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.
[719] Personal Communication between from Alan Hopkins to Steve Rottenborn, July 10, 2009.

*Northern Harrier (*Circus cyaneus*)*

The northern harrier, a CDFG Species of Special Concern, prefers coastal prairies, marshes, grasslands, swamps and other open areas. Although this species primarily eats small rodents (mice and voles), amphibians, small reptiles, small rabbits, and other birds, northern harriers will eat some invertebrates as well. Northern harriers usually return to the same area to nest in consecutive years. They nest on the ground in well-concealed locations, often near low shrubs or in tall clumps of vegetation. Nesting locations are usually in abandoned fields, wet meadows, and coastal and inland marshes. Wetlands and non-native grasslands provide suitable foraging habitat for small numbers of this species on the site, and northern harriers have been observed by Alan Hopkins in the Study Area.[720] However, due to the extent of disturbance by humans and pets, the lack of extensive wetlands suitable for nesting, and the vulnerability of ground-nesting birds to predation in upland portions of the Study Area, harriers are not expected to nest there. Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the City.[721]

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

*San Francisco Common Yellowthroat (*Geothlypis trichas sinuosa*)*

The San Francisco common yellowthroat is a California Species of Concern and is one of four subspecies of common yellowthroat that breed in California. The breeding range of the San Francisco common yellowthroat as described by Foster is bounded by Tomales Bay on the north, Carquinez Strait on the east, and Santa Cruz County on the south, which would include the Study Area.[722] Yellowthroats are found in freshwater marshes, coastal swales, swampy riparian thickets, brackish marshes, salt marshes, and the edges of disturbed weed fields and grasslands that border soggy habitats.[723] In the San Francisco Bay region as a whole, about 60 percent of yellowthroats breed in brackish marsh, 20 percent in riparian woodland/swamp, 10 percent in freshwater marsh, 5 percent in salt marsh, and 5 percent in upland vegetation.[724] The brackish marsh in the Study Area provides potential habitat for this species, although the limited extent of such habitat limits the possibility that the species currently breeds here. Common yellowthroats were observed between January 2003 and April 2004 during surveys along Yosemite Slough, though it is unknown whether these were San Francisco common yellowthroats or migrants/wintering birds of other races.[725] Field work

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[720] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[721] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas.*
[722] Foster, M. L., *Status of the salt marsh common yellowthroat (Geothylpis trichas sinuosa) in the San Francisco Bay Area, California 1975–1976*, California Department of Fish and Game (CDFG), 1977.
[723] Shuford, W.D., The Marin County breeding bird atlas. Bushtit Books. Bolinas, California. pp. 479, 1993.
[724] Hobson, K., P. Perrine, E.B. Roberts, M.L. Foster and P. Woodin, *A breeding season survey of salt marsh common yellowthroats (Geothylpis trichas sinuosa) in the San Francisco Bay Region.* Report of the San Francisco Bay Bird Observatory to the US Fish and Wildlife Service, 1986.
[725] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the eastern part of the City, including the Project vicinity.[726]

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "moderate" likelihood to occur within the Study Area.

*Short-eared owl (*Asio flammeus*)*

The short-eared owl, a California Species of Concern, is usually found in open areas with few trees such as annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and fresh emergent marshes. Its prey consists of small mammals, marsh birds, insects, reptiles, and amphibians.[727] The short-eared owl will usually nest on dry ground in a depression that is concealed in vegetation; occasionally the nest will be placed in a burrow. It requires dense vegetation for roosting and resting cover. This includes tall grasses, brush, ditches, and wetlands. Open, treeless areas containing elevated sites for perching are also needed. This species was observed by Alan Hopkins on the site[728] and the Study Area provides suitable foraging habitat for this species. As a result, short-eared owls are expected to forage occasionally in low numbers on the site. However, due to the extent of disturbance by humans and pets, the lack of extensive wetlands suitable for nesting, and the vulnerability of ground-nesting birds to predation in upland portions of the Study Area, short-eared owls are not expected to nest there. Field work for the *San Francisco Breeding Bird Atlas* in 1991-1993 did not detect breeding evidence by this species anywhere in the City.[729]

- Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

*Tricolored Blackbird (*Agelaius tricolor*)*

The tricolored blackbird, a California Species of Concern, is a highly social, marsh-nesting bird that lives in flocks numbering from less than one hundred to many thousands. Tricolored blackbirds are permanent residents of California, but birds make extensive migrations and movements, both in the breeding season and in winter, within their restricted range.[730] Tricolored blackbirds live in large colonies, and they prefer open accessible water, a protected nesting substrate such as flooded, thorny or spiny vegetation, and a suitable foraging space providing insect prey within a few miles of nesting colonies. Nesting habitat includes cattails and bulrushes or ungrazed grasslands containing tall grasses. Other plant species that are used for nesting include young willow thickets and wild rose. This species has been observed by Alan Hopkins on the Study Area[731] and the site provides suitable foraging habitat for the species. However, no

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[726] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas.*
[727] http://www.delta.dfg.ca.gov/gallery/shearowl.asp.
[728] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.
[729] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas.*
[730] Shuford, W. D., and Gardali, T., editors. 2008. *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.
[731] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27, 2004.

suitable breeding habitat is present, no colonies are known to occur in the area, and the *San Francisco Breeding Bird Atlas* did not confirm breeding by this species anywhere in the City.[732]

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area. However, this species is considered a California Species of Special Concern only when breeding. Because it is currently known to occur in the Study Area only as a non-breeder, it would not be considered a Species of Special Concern in the Study Area.

*White-tailed Kite (*Elanus leucurus*)*

The white-tailed kite is listed as a fully protected species under Section 3511 of the *California Fish and Game Code*. White-tailed kites feed on rodents, small reptiles, and large insects in fresh emergent wetlands, annual grasslands, pastures, and ruderal vegetation. They breed between February and October. Kites often roost, and occasionally nest, communally especially during the non-breeding season. Therefore, disturbance of a relatively small roost or nesting area could affect a large number of birds. The white-tailed kite can commonly be observed foraging in extensive open grasslands throughout most of the San Francisco Bay region. While white-tailed kites were not observed during surveys conducted by PBS&J biologists on the Project site, small numbers of individuals were observed during the Yosemite Slough Wildlife surveys.[733] The species is not known to nest on the site,[734] but the grasslands and ruderal habitats on the Project site provide suitable foraging habitat for small numbers of non-breeding individuals that occasionally occur there.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species is "known" to occur within the Study Area.

Terrestrial Mammals

*Western Red Bat (*Lasiurus blossevillii*)*

- The only special-status bat species potentially occurring within the Study Area is the western red bat (*Lasiurus blossevillii*). The western red bat is not known to breed in San Francisco, but the species is migratory, and red bats occur here during migration and possibly during winter. Western red bats are not colonial, and, thus, the species is expected to occur in the Study Area only in small numbers. They are known to roost in the foliage of a number of tree species, including eucalyptus. Potential habitat for this species is present within the eucalyptus and other mature trees within the Project site. However, most bat species are sensitive to human-generated disturbance. Identification of bats requires special surveys that were not conducted for this analysis. Therefore, the conservative assumption is that this species of sensitive bat is present within the Study Area.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "moderate" likelihood to occur within the Study Area.

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[732] San Francisco Field Ornithologists. 2003. *San Francisco Breeding Bird Atlas*.
[733] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.
[734] Personal Communication between from Alan Hopkins to Steve Rottenborn, July 20, 2009.

Sensitive Aquatic Resources

Mollusks

*Olympia Oyster (*Ostreola conchaphila*)*

Native Olympia oysters were historically abundant in San Francisco Bay. Oyster beds are a cornerstone in the benthic habitat, improving water quality, and providing habitat complexity that favors fish and vegetation. They also provide an important link between pelagic and benthic food webs. Their function in the estuarine food web—oyster beds generally increase fish abundance and thus make up an essential part of the Essential Fish Habitat (EFH)[735]—they are considered an important resource within this EIR as only a few relict populations remain in the Bay.[736]

- Recently, small populations of native oysters have been documented within the Bay.[737,738] Detailed surveys for native oysters were not conducted as part of this Project. Suitable habitat is distributed throughout the shoreline of Study Area. Suitable substrate is solid surfaces to which the larvae can easily attach.[739] Because the larval forms of oysters are free-floating in the Bay, and a large population exists south of the Study Area at Oyster Point Marina,[740] native oysters are likely present on suitable substrate throughout the Study Area.

Fish

*Green Sturgeon (*Acipenser medirostris*)*

The southern distinct population segment of green sturgeon (including those that reside in the Sacramento River) was listed as threatened under the FESA by NMFS on April 7, 2006.[741] Green sturgeon is a long-lived, anadromous, native fish that occurs in low numbers in the San Francisco Estuary and Sacramento River. Adults spawn in freshwater rivers from British Columbia south to the Sacramento River. In the Sacramento River, spawning occurs near Red Bluff and possibly in the Feather River. Larvae develop within these freshwater systems, migrate downstream, and remain in the estuaries for between 1 and 4 years before migrating to the ocean. Mature adults move into estuaries in the spring and spawning adults move up the rivers of their origins in late spring/early summer. Post spawning adults return to the estuary before migrating back to the ocean in late fall. Sub-adult fish also are thought to enter estuaries during

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735 National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) Species Distributions In San Francisco, San Pablo and Suisun Bays. Website: http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay. Accessed October 29, 2008.
735 National Marine Fisheries Service (NMFS). Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.
736 National Marine Fisheries Service (NMFS), No Date. *Native Oyster Habitat Restoration, Program Briefing Document*. Fisheries Southwest Region.
737 Harris, H.E., 2004. *Distribution and limiting factors of Ostrea conchaphila in San Francisco Bay, MS Thesis,* San Francisco State University.
738 Latta, M., 2006. Personal communication with Marilyn Latta, Habitat Restoration Director, Save the Bay, with D. Ebert and others at a meeting on October 18, 2006.
739 Harris, H.E., 2004. *Distribution and limiting factors of Ostrea conchaphila in San Francisco Bay, MS Thesis*, San Francisco State University.
740 MACTEC Engineering and Consulting, Inc. 2008. *Oyster Point Marina Olympia Oyster Surveys Pre- and Post-Dredging February 2008, Oyster Point Marina, South San Francisco, California*. Prepared for PBS&J.
741 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon*, 71 Federal Register 17757, 2006.

summer and fall months. The Study Area is along the San Francisco Bay, which is a saltwater habitat; the Study Area does not support the necessary freshwater spawning habitat for adult fish.[742] Juvenile fish and sub-adults may rear in the adjacent waters of San Francisco Bay.

The NMFS designated critical habitat for green sturgeon on October 2009.[743] Specific areas designated as critical habitat include: coastal US marine waters within 60 fathoms depth (360 feet) from Monterey Bay, California, north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; and certain coastal bays and estuaries in California, Oregon, and Washington. The areas designated comprise approximately 320 miles of freshwater river habitat, 897 square miles of estuarine habitat (including the San Francisco Bay), 11,421 square miles of marine habitat, and 135 square miles of habitat within the Yolo and Sutter bypasses. [744] Under the FESA, critical habitat includes those areas necessary to support the continued existence and recovery of this species. Critical habitat for green sturgeon includes all of San Francisco Bay. Critical habitat designations include the specific habitat and habitat functions that are necessary for the survival and recovery of the species; these are called primary constituent elements (PCEs). Within the estuarine category of critical habitat, the PCEs include food, flow, water quality, migratory pathways, depth, and sediment quality.[745] Food is an abundance of prey items, benthic invertebrates and shrimp, within the substrate upon which sturgeon can forage. Flow refers to ample movement of water within the estuary to allow adults to orient to the Sacramento River during their spawning migrations. Water quality refers to adequate levels of dissolved oxygen, salinity, and temperatures to allow for survival and growth. Water quality also includes low levels of contaminants that could affect survival or reproductive fitness. A migratory pathway refers to the fact that sturgeon migrate through the Bay to and from upstream spawning areas. The PCE for migratory pathways allows for safe and timely passage of fish between the ocean and upstream spawning areas, but it also includes localized movement of rearing and holding sturgeon within the Bay. The depth PCE refers to the variety of water depths required to provide suitable foraging, holding, and migratory areas. Sediment quality is important because sturgeons are benthic foragers (bottom feeders) and contaminant-free sediments support higher quality prey that do not affect the survival or reproductive fitness of the fish. The Study Area includes elements of all these PCEs. However, the sediment quality may be impaired by decades of industrial use, which has resulted in contamination (refer to Section III.K [Hazards and Hazardous Materials] of this EIR). This in turn probably reduces the foraging quality.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "high" likelihood to occur within the Study Area.

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[742] Moyle, Peter B. *Inland Fishes of California*, 2002, University of California Press.
[743]National Marine Fisheries Service (NMFS), *Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon*. 74 Federal Register 52300, October 9, 2009.
[744] Ibid.
[745] Ibid.

*Chinook Salmon (*Oncorhynchus tshawytscha*)*

Populations of Chinook salmon potentially found adjacent to the Project site fall into three Evolutionary Significant Units (ESUs): Winter-run, Spring-run, and Fall/late-Fall-run[746] Chinook salmon. The runs of Chinook are distinguished based on the timing of the adult return to freshwater on their spawning migration. At almost any time of year, there are Chinook at some life cycle stage or another within San Francisco Bay (Table III.N-3 [Life Cycle Stages and Periods of Freshwater Residency for Chinook Salmon]). The occurrence of Chinook adjacent to the Project site could involve any of those life stages. Juvenile fish are more likely to be found adjacent to the Project site than adults because they are moving downstream from their natal streams and do not have the same swimming ability as adults. Juvenile fish from the Sacramento River populations would be expected to occur in low numbers as they stray south of the Golden Gate. Small numbers of Chinook have also recently appeared in Coyote Creek and Guadalupe River, which are both tributaries to south San Francisco Bay near Alviso; these fish are derived from hatchery releases within the native range of the species, which did not include the South Bay.[747,748] Adult or juvenile fish from either of these populations would be expected to migrate through or past the Study Area on their way to and from the Pacific Ocean because the Study Area is between the Pacific Ocean and spawning sites in the South Bay. The overall likelihood of finding a substantial number of Chinook salmon within or adjacent to the Project site at any one time is relatively low because the open water of the Study Area is not considered suitable rearing habitat for either life stage. The residence time that either life stage may spend within or adjacent to the Project site is unknown.

Table III.N-3 Life Cycle Stages and Periods of Freshwater Residency for Chinook Salmon

Species	*Adult Migration (peak)*	*Spawning (peak)*	*Juvenile Freshwater Residency*	*Outmigration (peak)*
Winter Run	Dec–July (Mar)	Apr–Aug (May–June)	5–10 months	July Oct
Spring Run	Mar–Sep (May–June)	Aug–Oct (Sep)	3–15 months	Nov–Mar (Jan–Mar)
Fall Run	June–Dec (Sep–Oct)	Sep–Dec (Oct–Nov)	1–7 months	Dec–Mar
Late Fall Run	Oct–Feb (Dec)	Jan–Apr (Feb–Mar)	7–13 months	Apr–June (Dec–Mar)

SOURCE: Moyle, 2002.

Winter-run Chinook are listed as endangered under the California and federal *Endangered Species Act*s. They spawn in the Sacramento River upstream of Red Bluff Diversion Dam and are distinguishable from other Chinook runs based on the timing of both upstream migration and the spawning season (Table III.N-3). Prior to the construction of Shasta and Keswick dams in 1943 and 1955, respectively, winter-run Chinook spawned in the upper reaches of the Sacramento, McCloud, and lower Pit rivers,[749] and Battle Creek. Presently, the majority of winter-run Chinook spawning occurs on the main stem of the Sacramento River between Keswick Dam and the Red Bluff Diversion Dam.[750] Designated critical habitat extends from Keswick Dam, Shasta County (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of

746 Fall and late-fall run Chinook are treated as a single ESU by NMFS.
747 Santa Clara County, *Santa Clara County Habitat Plan, 1st Administrative Draft* August 2008. Website*:* http://www.scv-habitatplan.org/www/site/alias__default/292/1st_administrative_draft_hcp.aspx. Accessed July 2009.
748 National Marine Fisheries Service (NMFS). No Date. *Central Valley Chinook Salmon Distributions*. Southwest Regional Office. Website: http://swr.nmfs.noaa.gov/hcd/dist2.htm. Accessed July 17, 2009.
749 Moyle, P. B. 2002. *Inland Fishes of California*, University of California Press. 2002.
750 Ibid.

the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Critical habitat does not extend into the Study Area.

Spring-run Chinook salmon are listed as a threatened species under the California and federal ESAs. Spring-run Chinook enter the Sacramento River between March and September and move upstream into the headwaters, where they hold in pools until they spawn between August and October. Juveniles emigrate from the tributaries from mid-November through June; however, some juveniles spend a year in the streams and emigrate as yearlings the following October.[751] Typically, spring-run Chinook salmon use mid- to high-elevation streams that provide appropriate low water temperatures and sufficient flow, cover, and pool depth to allow over summering. Spawning occurs between August and October and, depending on water temperature, emergence occurs between November and March. Although Spring-run Chinook salmon emigration is highly variable, the emigration period extends from November to early May, with up to 69 percent of young-of-the-year out migrants passing through the lower Sacramento River between mid-November and early January.[752] Designated critical habitat extends from Keswick Dam, Shasta County (River Mile 302) to Chipps Island (River Mile 0) at the westward margin of the Sacramento-San Joaquin Delta; all waters from Chipps Island westward to Carquinez Bridge, including Honker Bay, Grizzly Bay, Suisun Bay, and Carquinez Strait; all waters of San Pablo Bay westward of the Carquinez Bridge; and all waters of San Francisco Bay (north of the San Francisco/Oakland Bay Bridge) from San Pablo Bay to the Golden Gate Bridge. Critical habitat does not extend into the Study Area.

Central Valley Fall and Late Fall-run Chinook salmon are not listed under the state or federal endangered species act but are classified as a Species of Special Concern. Fall-run Chinook salmon is the most abundant ESU, documented to comprise about 92 percent of the Sacramento Basin stock over the past 10 years of available data.[753] The ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin River basins and their tributaries, east of Carquinez Strait, California. Juvenile fall and late fall-run fish could stray into open waters within and adjacent to the Project site if they miss the entrance to the Golden Gate and the Pacific Ocean.

A small population of Chinook salmon has become established in recent years in Coyote Creek and the Guadalupe River.[754] The regulatory status of this population is unclear because the fall/late fall-run ESU only includes naturally spawned fish from upstream of Carquinez Strait. There is not an ESU that includes fish spawning within the tributaries of San Francisco Bay. These fish exhibit a fall-run pattern similar to the fall-run ESU of the Central Valley, and are apparently derived from wandering individuals, likely

751 Ibid.
752 Snider, B., and R.G. Titus. 2000. *Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing*, October 1996.
753 California Department of Fish and Game, Fisheries Branch, *Anadromous Resources Assessment, Chinook Salmon Escapement—All Runs*, February 18, 2009.
754 Santa Clara County, *Santa Clara County Habitat Concept Plan, 1st Administrative Draft* August 2008. Website: http://www.scv-habitatplan.org/www/site/alias__default/292/1st_administrative_draft_hcp.aspx. Accessed July 2009.

hatchery-released fish, from that ESU.[755] Regardless of where they came from or what their regulatory status may be, these fish would pass the Study Area on their way to and from the ocean.

Using the likelihood of occurrence definitions provided in Table III.N-5, the spring-run, winter-run/ and fall/late fall-run of this species has a "High" likelihood to occur within the Study Area.

*Central Valley Steelhead (*Oncorhynchus mykiss*)*

Central Valley steelhead (rainbow trout) were federally listed as a threatened species in 1998[756] and this status was reaffirmed in 2006.[757] The Central Valley steelhead population is a Distinct Population Segment (DPS; aka ESU) that includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries. Final critical habitat, designated in September 2005 for this species, does not include the Study Area.[758] Critical habitat is designated by hydrologic unit, the closest of which to the Study Area is the Sacramento Delta Hydrologic Unit, over 25 miles north of the Project site.[759] Central Valley steelhead, especially juveniles, may occasionally stray into the South Bay during their migration to the ocean, but the area adjacent to the Project site is generally outside their migratory pathway.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "low" likelihood to occur within the Study Area.

*Central California Coast Steelhead (*Oncorhynchus mykiss*)*

The Central California Coast DPS of steelhead is a federally threatened species.[760] This DPS includes all naturally spawned populations of steelhead from the Russian River south to, and including, Aptos Creek and includes the populations within San Francisco Bay.[761] Steelhead begin their migration from the ocean when winter rains provide large amounts of cold water for migration and spawning. Peak migration period for adult fish is in mid-winter. They typically spawn in smaller streams and tributaries to mainstream rivers. Juvenile steelhead generally spends one to three years in freshwater before migrating to the ocean.[762]

It is highly likely that both adults and juvenile steelhead from this DPS could be found adjacent to the Project site. The closest potential steelhead spawning streams in South San Francisco Bay are San Mateo Creek (approximately 10 miles south of the Study Area), Alameda Creek (approximately 16 miles south of the Study Area), and San Francisquito Creek (approximately 22 miles south of the Study Area). Other South Bay watersheds that support populations of steelhead include the Coyote Creek and Guadalupe River watersheds. Because the Study Area is between their spawning and rearing streams and the Pacific Ocean, fish from any

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755 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California*, 63 Federal Register 13347, 1998.
756 Ibid.
757 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead*; Final Rule, 71 Federal Register 834, 2006.
758 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Unites of Pacific Salmon and Steelhead in California*; Final Rule, 70 Federal Register 52488, 2005.
759 Ibid.
760 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California*, 63 Federal Register 13347, 1998.
761 National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead*; Final Rule. 71 FR 834.
762 Moyle, P. B. *Inland Fishes of California*, 2002, University of California Press, 2002.

of these streams could be found in the Bay adjacent to the Project site during adult migrations from the Pacific Ocean to spawning sites or during juvenile migrations from their natal streams to the Pacific Ocean.

The final critical habitat designation for the Central California Coast steelhead DPS was issued on September 2, 2005.[763] The specific primary constituent elements considered in the designation were freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas. The lateral extent of critical habitat in estuarine areas is the area inundated by extreme high tide. The Study Area is within the designated critical habitat for this species.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "high" likelihood to occur within the Study Area.

*Longfin Smelt (*Spirinchus thaleichthys*)*

Longfin smelt were listed under the California Endangered Species account as a threatened species in March 2009. This species is endemic to the west coast of North America with small populations likely still present in the Klamath River and Russian River estuaries.[764] However, the bulk of the longfin smelt population appears to be in San Francisco Bay.[765] Adults spawn in the Sacramento-San Joaquin Estuary almost as far upstream as the City of Sacramento on the Sacramento River and to Turner Cut on the San Joaquin River.[766] Adults spawn in these upstream freshwater locations in early winter. The larval smelt are distributed downstream by natural river flow. Because of this, the higher the outflow of freshwater from the Sacramento-San Joaquin Delta, the greater the distribution of smelt in the Bay. As they mature, swimming ability improves and their distribution expands. Adults occur into the South Bay and are also found in the ocean just outside the Golden Gate.[767] This species could be found in the Study Area from spring to fall before adults return upstream to spawn.

Using the likelihood of occurrence definitions provided in Table III.N-5, this species has a "moderate" likelihood to occur within the Study Area.

*Pacific Herring (*Clupea pallasi*)*

San Francisco Bay supports a small, yet productive commercial Pacific herring fishery. Pacific herring are not protected by either the state or the federal government; however, because herring are harvested for their roe, they are an important species in the economy of the San Francisco Bay Area and their populations are closely monitored by CDFG. Pacific herring are also an important species in the ecology of San Francisco Bay because herring, along with sardines and anchovies, are a primary food source for salmon and other sport fish. Pacific herring generally enter the Bay from November through April[768] of each year

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[763] National Marine Fisheries Service (NMFS), *Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Unites of Pacific Salmon and Steelhead in California*; Final Rule, 70 Federal Register 52488, 2005.
[764] Moyle, P. B. *Inland Fishes of California*, 2002, University of California Press, 2002.
[765] California Department of Fish and Game (CDFG), A Status Review of the Longfin Smelt (*Spirinchus thaleichthys*) in California, January 2009.
[766] Ibid.
[767] Ibid.
[768] National Oceanic and Atmospheric Administration (NOAA). 2008. San Francisco Bay Project Impact Evaluation System—Pile Driving. Coastal Restoration and Protection Division. Interactive GIS mapping software Website*:* http://mapping2.orr.noaa.gov/website/portal/pies/ naturalhistory.html. Accessed December 2, 2008.

and spawn in intertidal and sub-tidal habitats.[769] The actual sites where Pacific herring spawn in San Francisco Bay change from year to year and spawning may occur within numerous locations around the Bay. The North Bay is typically the preferred spawning area, although limited spawning has historically been observed at San Mateo Point.[770] The preferred substrate for herring spawning is eelgrass, followed by rocky seafloors, and lastly flat surfaces such as marina pilings, retaining walls, and bulkheads along the San Francisco Bay waterfront.[771] According to NMFS, known herring spawning areas within the area immediately adjacent to the Project site include several piers and areas of shoreline both north and south of the proposed marina (refer to Figure III.N-4 [Pacific Herring Spawning Habitat]).[772] Where Figure III.N-4 shows habitat as including piers, this refers to in-water portions of those structures. Also, the mapping data left gaps between the shoreline and the delineated habitat that is an artifact of the mapping. Spawning grounds could extend to the shoreline, especially in those areas where bulkheads define a vertical shoreline. The open channel to the northwest of the proposed marina between Blandy and E streets may be used by herring even though NMFS does not map it as spawning habitat.

Essential Fish Habitat

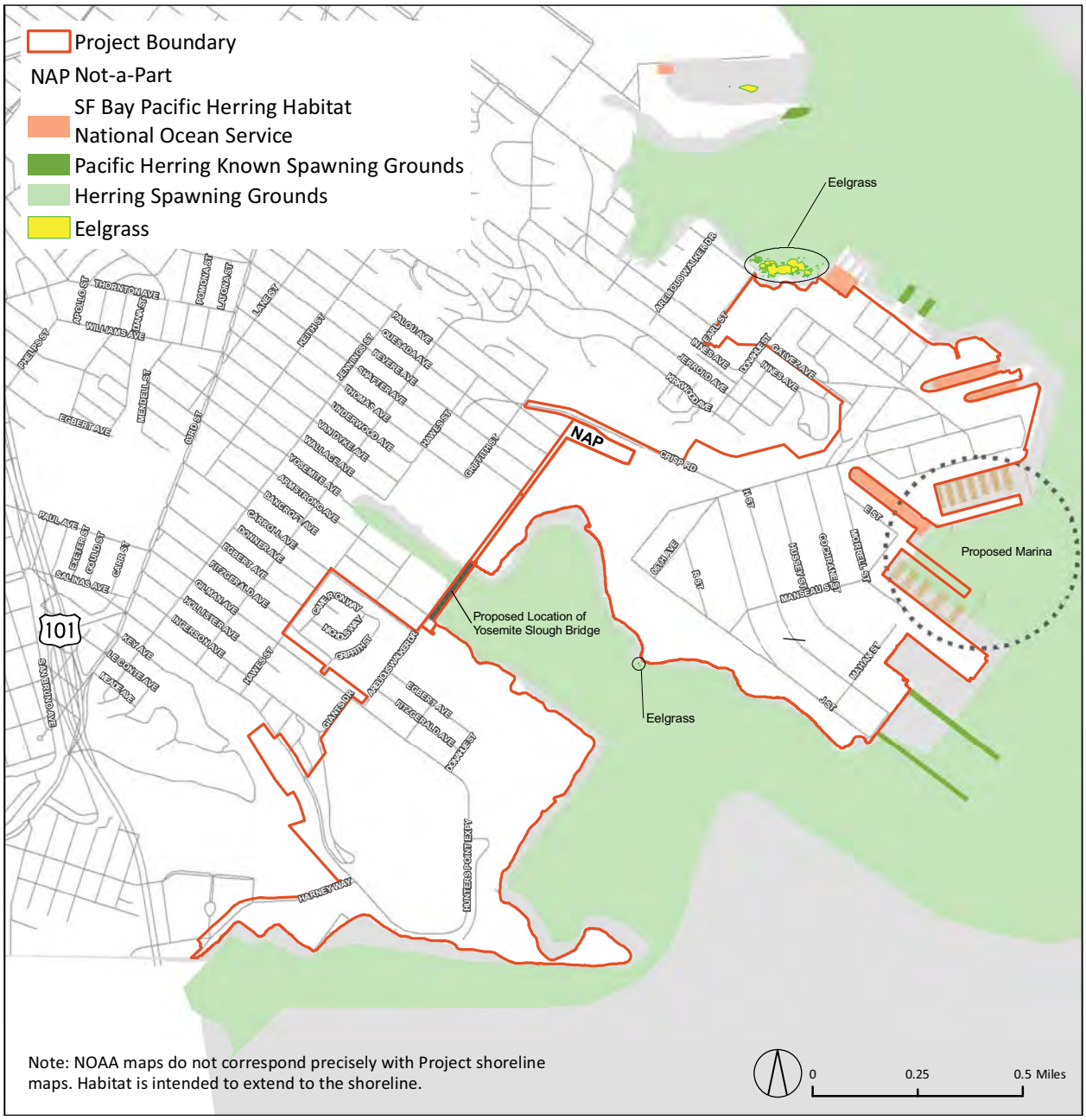
The tidal aquatic habitats adjacent to the Project site are considered EFH by the NMFS for a species assemblage that includes anchovies, sardines, rockfish, sharks, sole, and flounder.[773,774] Areas supporting the native Olympia oyster found in San Francisco Bay are also considered EFH by NMFS because oyster beds generally increase fish abundance. A more detailed discussion of the provisions of the *Magnuson-Stevens Fisheries Conservation Act*, by which effects on EFH are regulated, is provided below in Section III.N.3 (Regulatory Framework).

Wildlife Movement

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (i.e., juvenile animals from natal areas, or individuals extending range distributions); (2) seasonal migration; and (3) local movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover). A number of terms have been used in various wildlife movement studies, such as "wildlife corridor," "travel route," "habitat linkage," and "wildlife crossing," to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and facilitate the discussion of wildlife movement in this analysis, these terms are defined as follows:

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769 Barnhart, R.A. 1988. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Pacific herring. US Fish and Wildlife Service Biol. Rep.* 82(11.79). US Army Corps of Engineers, TR EL-82-4. 14 pp.
770 Miller, D. J. and J. Schmidtke. 1956. *Report on the distribution and abundance of Pacific herring (Clupea pallasi) along the coast of Central and Southern California.* California Fish and Game (CDFG) 42(3):163-187.
771 Barnhart, R.A. 1988. *Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Pacific herring. US Fish and Wildlife Service Biol. Rep. 82(11.79).* US Army Corps of Engineers, TR EL-82-4. 14 pp.
772 National Oceanic and Atmospheric Administration (NOAA). 2008. *San Francisco Bay Project Impact Evaluation System—Pile Driving.* Coastal Restoration and Protection Division. Interactive GIS mapping software Website*:* http://mapping2.orr.noaa.gov/website/portal/pies/ naturalhistory.html. Accessed December 2, 2008.
773 National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) Species Distributions In San Francisco, San Pablo and Suisun Bays. Website: http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay. Accessed October 29, 2008.
774 National Marine Fisheries Service (NMFS). Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.



SOURCE: NOAA PIESWebsite, 2008, Merkel and Associates 2003 SF Bay eelgrass survey.

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FIGURE III.N-4

Candlestick Point — Hunters Point Shipyard Phase II EIR

PACIFIC HERRING SPAWNING HABITAT

- **Travel route**—A landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (i.e., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another. It contains adequate food, water, and/or cover while moving between habitat areas and provides a relatively direct link between target habitat areas.
- **Wildlife corridor**—A patch of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bounded by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and facilitate movement while in the corridor.
- **Habitat linkage**—Larger, landscape-level movement features (often referred to as "habitat or landscape linkages") can provide both transitory and resident habitat for a variety of species to a more substantial, or wider, land connection between two habitat areas. Habitat linkages allow for the periodic exchange of animals between habitat areas, which is essential to maintain adequate gene pools.
- **Wildlife crossing**—A small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings may be manmade and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent "choke points" along a movement corridor.

Surveys of the Project site did not identify any major or regional wildlife corridor/travel route. The Project site is surrounded by open water and urban development that isolate habitats in the Study Area from large expanses of similar habitats in undeveloped areas elsewhere along the San Francisco Bay shoreline and in the San Bruno Mountain State Park (approximately 2 miles to the southwest). There is localized movement, as ground-dwelling animals forage for food, mate, and move between habitat patches within the Project site. Although there is localized movement between Bayview Hill and the CPSRA, Bayview Hill is also isolated from larger expanses of habitat, and movement by mammals, reptiles, and amphibians between the site and any larger expanses of natural habitat (such as San Bruno Mountain to the southwest) is severely impeded by US-101 and other roads and urban development.

In addition, although bird flyways are not traditionally considered "wildlife movement corridors," the San Francisco Bay's wetlands and tidal lands serve as important habitat for bird species during migration through the Pacific Flyway. Many bird species use these areas as an annual stopover location for several days of rest and feeding prior to continuing migration. These habitats also provide critical staging areas for migratory species. Thus, the Study Area is a minor, but important component of the much larger Bay system that provides habitat for migratory birds.

III.N.3 Regulatory Framework

Federal

Section 404 of the Clean Water Act

Section 404 of the *Clean Water Act* (CWA) (33 *United States Code* [USC] §§ 1344) requires that a permit be obtained from the USACE prior to the discharge of dredged or fill materials into any "waters of the United States or wetlands." Waters of the United States are broadly defined in the USACE regulations to include

navigable waterways, their tributaries, lakes, ponds, and wetlands. Wetlands are defined as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that normally do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."[775] Wetlands that are not specifically exempt from Section 404 regulations (such as drainage channels excavated on dry land) are considered to be "jurisdictional wetlands." The USACE is required to consult with the USFWS, NMFS, Environmental Protection Agency, and State Regional Water Quality Control Board (SWRCB) in carrying out its discretionary authority under Section 404.

The USACE grants three types of permits: individual, general, and nationwide. Project-specific individual permits are required for certain activities that may have a potential for more than a minimal impact and necessitate a detailed application. A permit from the USACE would be required for any placement of fill in waters of the US as part of the Project.

Section 402 of the Clean Water Act

The primary mechanism in the CWA regulating the discharge of pollutants is the National Pollutant Discharge Elimination System (NPDES), which is administered by the Environmental Protection Agency (EPA). Under the NPDES program, a permit is required from EPA or an authorized state for the discharge of any pollutant from a point source into the waters of the US (33 USC §§1342). Storm water pollution prevention plans must be prepared for construction activities as part of the NPDES permitting process.

Section 401 of the Clean Water Act

Section 401 of the CWA (33 USC §§ 1341) requires a state-issued Water Quality Certification for all projects requiring a Section 404 permit, or other federal permit or license. There are nine Regional Water Quality Control Boards (RWQCBs) across the state that issue Water Quality Certifications for various actions within their respective region. The RWQCB, San Francisco Bay Region, issues Section 401 Water Quality Certifications for the City and County of San Francisco. A Section 401 certification requires a determination that the Project will comply with all state water quality standards.

Federal Endangered Species Act (FESA)

The FESA was enacted in 1973. Under the FESA, the Secretary of the Interior and the Secretary of Commerce have the authority to list a species as threatened or endangered (16 USC 1533[c]). The FESA is administered by both the NMFS and the USFWS. The NMFS is accountable for animals that spend most of their lives in marine waters, including marine fish, most marine mammals, and anadromous fish such as Pacific salmon. The USFWS is accountable for all other federally listed plants and animals.

Pursuant to the requirements of FESA, a federal agency authorizing, funding or carrying out a project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present within the Study Area and determine whether the agency's action could affect any federally listed species (16 USC 1536(a)(2), (3).) If the action would likely affect a listed species, the agency must consult with the USFWS or NMFS under Section 7 of the FESA to determine whether the action is likely

[775] US Army Corps of Engineers, *Definition of Waters of the United States*, 33 CFR 328, November 1986.

to jeopardize the continued existence of the species or result in the destruction or adverse modification of designated critical habitat (16 USC 1536(a)(2).) Project-related adverse effects to these species or their habitats are typically considered significant under CEQA and thus would require mitigation.

The USFWS Regional Office in Sacramento maintains a list of "species of concern" that receive special attention from other federal agencies (i.e., NMFS) during environmental review, although they are not protected under FESA. Project-related impacts to such species could be considered significant under CEQA Guidelines section 15380 and could require mitigation.

Section 9 of the FESA prohibits any person or federal agency from "taking" endangered or threatened wildlife. The definition of "take" includes harassing, harming, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. A notable component of this definition is the definition of "harm." "Harm" in the definition of "take" means an act that actually kills or injures protected wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.

Projects that would result in "take" of any federally listed threatened or endangered species are required to obtain incidental take authorization from NMFS or USFWS through either the Section 7 (interagency consultation) process described above or Section 10(a) (incidental take permit) of FESA. The Section 7 authorization process is used to determine if a project with a federal nexus would jeopardize the continued existence of a listed species and what mitigation measures would be required to avoid jeopardizing the species. The Section 10(a) process allows take of endangered species or their habitat when no other federal government action is involved. Because the Project could affect a federally listed species and would require a federal (Section 404) permit, pursuant to Section 7 of the FESA, the USACE must initiate consultation with USFWS or NMFS prior to carrying out its discretionary authority under Section 404 of the CWA.

Migratory Bird Treaty Act (MBTA)

The federal *Migratory Bird Treaty Act* (MBTA; 16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in any native bird that may occur within the Study Area except in accordance with regulations prescribed by the Secretary of the Interior. It is an international treaty for the conservation and management of bird species that migrate through more than one country, and is enforced in the United States by the USFWS. This act encompasses whole birds, parts of birds, and bird nests and eggs and provides protection to over 800 species in the United States. All native birds in the Study Area are protected by the MBTA.

Marine Mammal Protection Act

The *Marine Mammal Protection Act* (MMPA) was enacted in 1972 and amended through 2007(16 USC 1631). All marine mammals are protected by the MMPA, which prohibits their take in US Waters. Take is defined in the MMPA as "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect" [16 USC 1631 Section 3(13)]. This is a slightly different definition than the FESA, which also encompasses "attempts" to engage in these activities. Under the MMPA, "harassment" is further defined as any action that of pursues, torments, or annoys a marine mammal and which has the potential to injure or disturb a marine mammal or marine mammal stock in the wild including alteration of behavior patterns including migration, breathing, nursing, breeding, feeding, or sheltering [16 USC 1631 Section 3(18(A))].

Species that occur within San Francisco Bay on a regular basis that are protected by the MMPA include the harbor seal and the California sea lion. The MMPA would apply to the Project, because in-water construction activities such as pile driving could harass these animals.

Magnuson-Stevens Fisheries Conservation Act and Management Act

The NMFS has the authority to implement the *Magnuson-Stevens Fisheries Conservation and Management Act* (Public Law 94-264; MSA). The *Magnuson-Stevens Act* (MSA) was amended and reauthorized on January 12, 2007, by the *Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act* (PL 109-479). The MSA was put into place to promote conservation and management of the Nation's fishery resources. The MSA established the Pacific Fishery Management Council, which was tasked with creating the Pacific Coast Groundfish Fishery Management Plan (FMP).[776] The most recent amendment to the FMP was adopted by NMFS in May 2006.[777] The FMP develops recommendations for the management of groundfish fisheries, and in some cases, it contains specific fishery management recommendations. [778] In addition, the FMP addresses provisions in the MSA relating to EFH to ensure that fishery resources are managed through the regulation of EFH. The MSA defines EFH as "... those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" [16 USC 1802 MSA Section 3(10)]. The terms in this definition have been further defined to include:[779]

- Aquatic habitat and associated physical, chemical, and biological properties that are used by fish (historically used areas may be included)
- Sediment, stream substrates, instream structure, and associated biological communities
- The habitat required to support a sustainable fishery including that particular species' place in a properly functioning ecosystem
- The habitat required to support a full life cycle for the species under consideration

The tidal aquatic habitats adjacent to the Project site are considered EFH by NMFS for a species assemblage that includes anchovies, sardines, rockfish, sharks, sole, and flounder.[780,781] Areas supporting the native Olympia oyster found in San Francisco Bay are also considered EFH by NMFS because oyster beds generally increase fish abundance. In addition, eelgrass beds are considered EFH. The NMFS consults with federal action agencies under the MSA in a process similar and often parallel to the Section 7 FESA consultation. Because the Project would modify designated EFH, consultation with NMFS under the MSA is anticipated and would be initiated by the USACE during the permitting process for the Project.

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776 PFMC (Pacific Fisheries Management Council) 2006. *Pacific Coast Groundfish Fishery Management Plan as revised through Amendment 19* (March 2006).

777 National Marine Fisheries Service (NMFS). 2006. *Magnuson-Stevens Act Provisions; Fisheries off West Coast States; Pacific Coast Groundfish Fishery: Final Rule*. 71 FR 27408.

778 National Marine Fisheries Service (NMFS). 2006. *Magnuson-Stevens Act Provisions; Fisheries off West Coast States; Pacific Coast Groundfish Fishery: Final Rule*. 71 FR 27408.

779 Pacific Fisheries Management Council (PFMC) 2003. *Pacific Coast Salmon Plan – Fishery management plan for commercial and recreational salmon fisheries off the coast of Washington, Oregon, and California as revised through Amendment 14* (adopted March 1999).

780 National Marine Fisheries Service (NMFS). 2006. Fisheries Management Plan (FMP) *Species Distributions In San Francisco, San Pablo and Suisun Bays*. Website: http://swr.nmfs.noaa.gov/hcd/loclist.htm#South%20SF%20Bay. Accessed October 29, 2008.

781 National Marine Fisheries Service (NMFS).Essential Fish Habitat (EFH) for Pacific Coast Groundfish. Map dated July 26, 2008.

Section 10 of the Rivers and Harbors Act of 1899

Section 10 of the *Rivers and Harbors Act of 1899* (33 USC 403) gives the USACE jurisdiction over tidal waters of the US from the MHW elevation seaward (33 USC 403.382.4b). Specifically, it prohibits the construction, dredging, or fill of any navigable water without a permit from the USACE. This includes construction of breakwaters or marinas, installation of pilings, docks, or bridges, and excavation of existing substrates.

The Project would require placement of fill for bridge construction, shoreline revetments, breakwaters, installation of pilings and marina floats, and installation of gangways for access to the docks. All of these activities would be subject to the USACE jurisdiction under Section 10 of the *Rivers and Harbors Act*, and USACE authorization of these activities must be obtained through the permitting process for the Project.

State

California Endangered Species Act (CESA)

The CESA was enacted in 1984. Under the CESA, the California Fish and Game Commission has the responsibility for maintaining a list of threatened and endangered species. Pursuant to the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the Study Area and determine whether the Project would have an adverse effect on such species. In addition, CDFG encourages informal consultation on any project that may impact a candidate species. Peregrine falcons nest within the Study Area, as noted above, and are listed as endangered under the CESA, although the species is proposed to be delisted.

Section 2080 of the *California Fish and Game Code* prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. Take is defined in Section 86 of the *California Fish and Game Code* as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Sections 2081(b) and (c) of the *California Fish and Game Code* allow CDFG to issue an incidental take permit for a state-listed threatened or endangered species only if specific criteria are met, such as take incidental to an otherwise lawful activity. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project-caused losses of listed species populations and their essential habitats.

Fish and Game Code—Sections 1602, 3503, 3503.5, 3511, 3513, 4150, 4700, 5050, and 5515

California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Birds of prey are further protected under *California Fish and Game Code* Section 3503.5, which states that "it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by CDFG. Similarly, Section 4150 of the *California Fish and Game Code* describes protections for nongame mammals.

California Species of Special Concern is a designation used by the CDFG for some declining wildlife species that are not state candidates for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as having special status by the CDFG. Under CEQA Guidelines (Section 15380), potential impacts to these species must be assessed.

California laws relating to Fully Protected species (i.e., Section 3511) were among the first attempts in the nation to provide additional protection to animals that were rare or faced possible extinction, predating even the FESA. Most fully protected species have also been given additional protection under more recent laws and regulations, and many have been listed under state and federal versions of the FESA. Fully Protected species (such as the peregrine falcon and white-tailed kite) may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Four sections of the *California Fish and Game Code* list 37 fully protected species (*California Fish and Game Code* Sections 3511, 4700, 5050, and 5515). Each of these statutes (1) prohibits take or possession "at any time" of the species listed in the statute, with few exceptions, (2) states that no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to "take" the species, and (3) states that no previously issued permits or licenses for take of the species "shall have any force or effect" for authorizing take or possession.

Section 1602 of the *California Fish and Game Code* requires a Streambed Alteration Agreement for any activity that may alter the bed and/or bank of a lake, stream, river, or channel. Typical activities that require a Streambed Alteration Agreement include excavation or fill placed within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. A Streambed Alteration Agreement would be required as part of the permitting process for this Project.

Porter-Cologne Water Quality Control Act

The *Porter-Cologne Water Quality Control Act* (California Water Code Sections 13000 et seq.) charges the SWRCB and the nine RWQCBs statewide with protecting water quality throughout California. Typically, the SWRCB and RWQCB act in concert with the USACE under Section 401 of the *Clean Water Act* in relation to permitting fill of federally jurisdictional waters. The US Supreme Court has acted to limit the regulatory jurisdiction of the USACE under Section 404 of the *Clean Water Act*.[782] This action did not limit the State's regulatory jurisdiction over Waters of the State.[783] Waters of the State are defined in Section 13050(e) of the *Porter-Cologne Water Quality Control Act* as "…any surface water or groundwater, including saline waters, within the boundaries of the state."

Wetlands are delineated in accordance with methodology presented in the 1987 *Corps of Engineers Wetlands Delineation Manual*[784] and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West*

[782] United States Supreme Court (USSC), *Solid Waste Agency of Northern Cook County v. US Army Corps of Engineers*. 531 US 159(2001), also known as the "SWANCC decision."
[783] Guzy, G.S. and R.J. Andersen., *Memorandum from the Corps regarding: Supreme Court ruling concerning CWA jurisdiction over isolated waters.* Website: http://www.spn.usace.army.mil/regulatory/ swancc.pdf, 2001.
[784] Environmental Laboratory*, Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1, US Army Engineer Waterways Experiment Station. Vicksburg, Miss., 1987.

Region.[785] Applicants have this delineation verified by the USACE and, in cases where an area meets the criteria to be considered a wetland, but the USACE does not have jurisdiction, the applicant is referred to the appropriate RWQCB. For the Study Area, the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) could exercise its jurisdiction over wetlands where a project does not require a federal permit, but involves removal or placement of material into Waters of the State. The USACE has indicated that the waters and wetlands potentially impacted by the Project are subject to its jurisdiction. A Section 401 clean water certification or waiver would be required as part of the permitting process for this Project.

The McAteer-Petris Act (California Government Code 66600–66682)

The *McAteer-Petris Act* created the San Francisco Bay Conservation and Development Commission (BCDC) in 1965. BCDC's mission is the preservation of San Francisco Bay from indiscriminate filling. BCDC's first task was compilation of a comprehensive study of the Bay and determination of how future development of the Bay should occur. This effort resulted in the San Francisco Bay Plan in 1968. In 1969 the findings and policies of the Bay Plan were incorporated into the *McAteer-Petris Act*, which was amended making BCDC a permanent state agency. The Bay Plan continues to evolve and remains the guiding document for BCDC's actions. Section 66610 of the *McAteer-Petris Act* establishes the boundaries of San Francisco Bay in relation to BCDC's jurisdiction. Essentially, all areas below the mean high tide line and an area within a shoreline band that extends landward for 100 feet from the mean high tide line are subject to their jurisdiction. Section 66632 of the *McAteer-Petris Act* establishes the permitting process for projects that would place fill in, on, or over any part of BCDC's jurisdiction as defined in Section 66610. Some aspects of the Project would be in the water or within the shoreline band and, therefore, subject to BCDC's jurisdiction.

■ Regional

Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) Management Plan

In 1999, under the authority of the federal FESA, NOAA Fisheries and the USFWS, and the CDFG, under the CESA, completed a programmatic consultation for the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) Management Plan[786]. NOAA Fisheries, USFWS and CDFG concluded that the LTMS program was not likely to jeopardize the continued existence of listed species under their jurisdiction. The respective biological opinions provided an incidental take statement, which authorized the take of listed species that may inadvertently occur during dredging and dredged material disposal activities that adhere to the environmental work windows set forth in the LTMS Management Plan. Therefore, permitted dredging activities that conform to the Environmental Work Windows can be completed without the need to consult with the resource agencies under the FESA and the CESA. Any project proposing to conduct dredging activities outside of the LTMS environmental work windows is required to undertake either informal or formal consultation with the appropriate resource agencies (NOAA Fisheries, USFWS, and CDFG).

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[785] US Army Corps of Engineers, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, Wetlands Regulatory Assistance Program, Vicksburg, Miss., September 2008.
[786] LTMS Environmental Work Windows Work Group. LTMS Informal work windows, Informal consultation preparation packet. Draft version 1.4. February 2004. Website: http://www.spn.usace.army.mil/conops/informal.pdf.

San Francisco Bay Trail Plan

Refer to Section III.A Land use and Plans for a description of the Bay Trail Plan. Environmental Protection Policies relevant to the Project are listed below.

Environmental Protection Policies[787]

23. The Committee is aware of the ecological value of wetlands; in many cases, they provide habitat for a variety of endangered species. In the San Francisco Bay Area, these areas serve as a vital link in the Pacific flyway for feeding, breeding, nesting and cover for migratory birds. To avoid impacts in wetlands habitats, the Bay Trail should not require fill in wetlands, and should be designed so that use of the trail avoids adverse impacts on wetland habitats.
24. Future support facilities serving the Bay Trail should be designed and constructed in such a manner that they do not impact fish and wildlife resources, especially wetlands. These facilities should be located and designed in a way that no fill of wetlands will be required.
26. The path will not always follow the Bay shoreline; inland reaches may be more appropriate, especially for bicycle travel, in some parts of the San Francisco Bay region.
28. Where the alignment of the Bay Trail may more appropriately be located away from the shoreline in order to protect particularly sensitive habitats, access to shoreline areas may be possible by connecting the Bay Trail to existing loop trails and other interpretive facilities. These access points should be planned and designed to make clear the distinction between the continuous Bay Trail and the interpretive trail. (Features may include different trail surfaces, marked entry points to interpretive areas, expanded facilities for education and shoreline interpretation, signage, regulation and enforcement of regulations.)
29. Provision of land or funds for Bay Trail planning or construction shall not be considered mitigation for wetland losses.

Candlestick Point State Recreation Area General Plan

Refer to Section III.A Land Use and Plans for a description of the CPSRA GP. The following excerpt is related to natural resource management:[788]

> It is the policy of the department to protect the scenic values and to enhance, manage, and protect the biotic and natural resources of the area, while fully realizing the potential of the area for fulfillment of outdoor recreation needs. A wetland restoration and management plan shall be developed for the area north and east of the extension of Yosemite Avenue to the Bay, an area known as the Nature Area. The plan shall include provisions for natural restoration and removal of debris, design of a shoreline configuration that provides a healthy intertidal action, revegetation, and wildlife habitat enhancement. This plan shall be developed in coordination with local, Bay protection, and wildlife agencies.

San Francisco Bay Plan

Refer to Section III.A Land Use and Plans for a description of the Bay Plan. A summary of the policies related to biological resources are provided below.

[787] Bay Trail Plan. 1999. Electronic file: http://baytrail.abag.ca.gov/baytrailplan.html#designguidelines. July 30.
[788] State Department of Parks and Recreation. Candlestick Point State Recreation Area General Plan, March, 1988.

Policies Concerning Fish, Other Aquatic Organisms and Wildlife in the Bay, Tidal Marshes and Tidal Flats Around the Bay, and Subtidal Areas in the Bay [789]

The SFBCDC shall protect native fish species, other aquatic organisms, other listed wildlife species and their specific habitats under the *California Endangered Species Act* or federal *Marine Mammal Protection Act* within the Bay's tidal marshes, tidal flats, and subtidal habitat. To the greatest extent feasible, specific habitats such as tidal marsh, tidal flats, and subtidal habitats shall be conserved, restored, and increased. Specific habitats that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, species that the CDFG has determined are candidates for listing as endangered or threatened under the California *Endangered Species Act*, or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes. In reviewing or approving habitat restoration programs the SFBCDC should follow the recommendations in the Baylands Ecosystem Habitat Goals and provide a diversity of habitats for native aquatic and terrestrial plant and animal species. For projects that may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species the SFBCDC should consult and give appropriate consideration to the recommendations of the California Department of Fish and Game and the US Fish and Wildlife Service or the National Marine Fisheries Service and not authorize projects that would result in the "taking" of any plant, fish, other aquatic organism or wildlife species listed as endangered or threatened pursuant to the state or federal endangered species acts, or species that are candidates for listing under the CESA, unless the project applicant has obtained the appropriate "take" authorization from the US Fish and Wildlife Service, National Marine Fisheries Service or the California Department of Fish and Game. However, the SFBCDC may permit a minor amount of fill or dredging in wildlife refuges, shown on the Plan Maps, necessary to enhance fish, other aquatic organisms and wildlife habitat or to provide public facilities for wildlife observation, interpretation and education.

Policies Concerning Shoreline Protection around the Bay[790]

New shoreline erosion control projects and the maintenance or reconstruction of existing erosion control facilities should be authorized if *(a)* the project is necessary to protect the shoreline from erosion; *(b)* the type of the protective structure is appropriate for the project site and the erosion conditions at the site; and *(c)* the project is properly designed and constructed. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design of erosion control projects.

Policies Concerning Dredging in the Bay[791]

Dredging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay and certain waterways over time to achieve the LTMS goal of limiting in-Bay disposal volumes to a maximum of one million cubic yards per year. The LTMS agencies should implement a system of disposal allotments to individual dredgers to achieve this goal only if voluntary efforts are not effective in reaching the LTMS goal. In making its decision regarding disposal allocations, the Commission should confer with the LTMS agencies and consider the need for the dredging and the dredging projects, environmental impacts, regional economic impacts, efforts by the dredging

[789] SFBCDC, San Francisco Bay Plan, Reprinted February 2008.
[790] Ibid.
[791] Ibid.

community to implement and fund alternatives to in-Bay disposal, and other relevant factors. Small dredgers should be exempted from allotments, but all dredgers should comply with the SFBCDC policies.

Local

Yosemite Slough Restoration Plan

The Yosemite Slough Restoration Plan (2005) was developed on behalf of the State Parks Department, in accordance with the CPSRA GP. The restoration of Yosemite Slough would create the largest contiguous wetland area in San Francisco. The restoration project would help restore essential wildlife habitat, improve water quality, and prevent erosion along the shoreline of the City—an area of the bay where tidal wetlands have been most impacted and suffered the greatest loss due to urbanization.

Goals and objectives of the restoration include the following:

- Increase the area subject to tidal influence by excavating three areas that were formerly part of San Francisco Bay.
- Restore habitat diversity by adding 12 acres of tidally influenced wetlands and marsh area and remove chemically impacted soils from upland areas to improve the quality of existing habitat.
- Improve habitat for special-status species (i.e., western snowy plover and double-crested cormorants) by creating two nesting islands.
- Improve the quality of life for the surrounding community by creating a clean, beautiful local park for viewing wildlife habitat.
- Create an environmental area that local schools can use for field trips.
- Connect to the Blue Greenway, an important effort to build 13 miles of Bay Trail along the southern waterfront of the San Francisco Bay Trail.

City of San Francisco General Plan

The following goals and policies related to biological resources protection are included in the Environmental Protection Element of the *San Francisco General Plan*, and are relevant to the Project:

<u>General</u>

Objective 1 Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

- Policy 1.1 Conserve and protect the natural resources of San Francisco.
- Policy 1.2 Improve the quality of natural resources.
- Policy 1.3 Restore and replenish the supply of natural resources.
- Policy 1.4 Assure that all new development meets strict environmental quality standards and recognizes human needs.

<u>Bay, Ocean, and Shorelines</u>

Objective 3 Maintain and improve the quality of the bay, ocean, and shoreline areas.

- Policy 3.1 Cooperate with and otherwise support regulatory programs of existing regional, state, and federal agencies dealing with the Bay, Ocean, and Shorelines.

Policy 3.2 Promote the use and development of shoreline areas consistent with the General Plan and the best interest of San Francisco.

Land

Objective 7 Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

Policy 7.3 Require that filling of land adhere to the highest standards of soils engineering consistent with the proposed use.

Flora and Fauna

Objective 8 Ensure the protection of plant and animal life in the City.

Policy 8.1 Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

Policy 8.2 Protect the habitats of known plant and animal species that require a relatively natural environment.

Policy 8.3 Protect rare and endangered species.

San Francisco Municipal Code

Urban Forestry Ordinance

The City provides protection for trees around the City by way of its Urban Forestry Ordinance (Ord. 165-95, App. 5/19/95), Article 16, Sections 806 (Planting and Removal of Street Trees) through 810 (Significant Trees) of the *Public Works Code*. "Significant trees" are defined as trees within 10 feet of a public right-of-way that also meet one of the following size requirements: 20 feet or greater in height; 15 feet or greater in canopy width; or 12 inches or greater diameter of trunk measured at 4.5 feet above grade. Among the factors considered in the removal of significant trees are the following: their size, age, and species; visual and aesthetic characteristics; cultural or historic characteristics; ecological and location characteristics. Street trees are also protected by the City's Urban Forestry Ordinance and both require a permit for removal. The ordinance also provides a process for designating trees as landmark trees, and protects significant, landmark, and street trees during construction activities. This ordinance applies to limited areas of the Project site where there are significant trees, street trees, and/or landmark trees.

Planning Code

Section 143 of the San Francisco Planning Code requires the installation of one street tree for each 20 feet of property frontage along each street or alley, with any remaining fraction of 10 feet or more of frontage requiring an additional tree for the owner or developer of a new or relocated building, or a building with 20% or more floor area expansion in specified districts.[792] This ordinance applies to the R, SPD, RSD, NC, C-3, DTR, MUG, MUO, MUR, UMU, SLR, SLI, and SSO Districts.

[792] Amended by Ord. 414-85, App. 9/17/85; Ord. 69-87, App. 3/13/87; Ord. 115-90, App. 4/6/90; Ord. 298-08, File No. 081153, App. 12/19/2008.

III.N.4 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to biological resources, but generally consider that implementation of the Project would have significant impacts if it were to:

N.a Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

N.b Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS.

N.c Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

N.d Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

N.e Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

N.f Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Analytic Method

As mentioned in Section III.N.2 (Setting), PBS&J staff biologists reviewed existing studies of the Project site and conducted reconnaissance-level surveys of the Project site on August 9, 2007, May 5, 2008, and July 8, 2008.

The analysis provided below considers the potential direct, indirect, and cumulative effects of construction and implementation of the Project described in Chapter II, including both on-site and off-site impacts. Potential impacts are analyzed using information identified in Chapter II, the environmental setting for biological resources, results of literature and field surveys, and the adequacy of on-site habitat for potentially occurring special-status species, and comparing this information to the Significance Criteria that were identified in the previous section. In general, impacts are separated by plan element (i.e., Candlestick Point and HPS Phase II) and are indicated by an "a" and "b," respectively, in the impact number. In addition, several impacts contain separate discussions of the proposed bridge over Yosemite Slough.

Identifying the impacts to biological resources that would result from construction of the CP/HPS Project is complicated by the fact that future remediation activities would modify existing site conditions before some CP/HPS Project components are constructed. As a result, the "baseline conditions" for the purpose of the Settings section above (i.e., existing conditions observed during field surveys conducted in the preparation of this EIR, plus other data collected or research conducted within the Study Area since 2003) are not necessarily the conditions that would be present when Project components are constructed. For example, on Parcels E and E-2, it is expected that remediation by the Navy would result in the removal

and/or capping of contaminated materials and construction of a shoreline revetment that would prevent erosion of materials on these parcels. These remediation activities (including revetment construction) would result in impacts to most of the wetlands that have been identified on Parcels E and E-2. As mitigation of these impacts, the Navy has proposed constructing new wetlands in the southwestern portion of HPS after remediation efforts are completed. Although the CP/HPS Project may construct the Yosemite Slough bridge and its approaches before the Navy's remediation efforts are concluded, other portions of Parcels E and E-2 are not expected to be improved as part of this Project until the Navy has completed its removal of radiological contamination. As a result, when CP/HPS improvements are made, wetlands on Parcels E and E-2 may be limited to the Navy's wetland mitigation site, with the remaining wetlands impacted by the Navy's fill and the revetment. To adequately characterize the impacts of the CP/HPS Project to biological resources, impacts to potentially affected resources (such as wetlands) are analyzed under two scenarios: assuming construction of Project improvements occurs prior to completion of Navy remediation activities, and assuming Navy remediation occurs first.

Impacts to special-status species would be significant (in the absence of mitigation) if the Project would adversely affect any of the following: (1) a species listed as threatened or endangered by the state or federal government at the time the Draft EIR is published; (2) a major population or subpopulation of a species that would result in the regional decline of this species; (3) a relatively large number of individuals within a population that is considered rare or declining; (4) a species' metapopulation (i.e., if one of only a few known populations occurs in the impact zone, or if the species has extremely narrow habitat requirements); or (5) a habitat type or vegetation community in regional decline or that is regionally endemic and is recognized as such by the local, state, or federal agencies identified in the Setting section. As discussed in the Setting section, those species or habitats with a "Not Likely," or "Absent" likelihood of occurrence in Table III.N-5 will not be addressed further as they are not expected to occur on the site or be affected by the Project.

Impacts to sensitive or rare species would be less than significant, even without mitigation, if they are not expected to substantially affect species or populations because (1) a relatively small number of non-listed individuals would be impacted; (2) the number of individuals of a non-listed species to be impacted represent a very small fraction of regional populations due to the species' regional abundance; (3) recovery and conservation efforts are documented to adequately conserve the species or habitat, and impacts would not affect the recovery or conservation of this species or habitat; or (4) the species or habitat is locally common and fairly abundant in the region.

This section presents Project Impacts at the conclusion of the discussion of individual impacts at Candlestick Point and HPS Phase II, beginning with Impact BI-22 and concluding with Impact BI-26.

Construction Impacts

Impact BI-1: Regional Conservation Plans

Impact BI-1 **Implementation of the Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. (No Impact)** ***[Criterion N.f]***

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans that cover the Study Area. Therefore, the Project would not conflict with a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Consequently, no impact to such plans would occur. No mitigation is required.

Impact BI-2: Common Species and Habitats

Impact BI-2 **Implementation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any common species or habitats through substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant)** ***[Criterion N.d]***

As listed in the Setting section, numerous common plant and wildlife species occupy the Study Area. Common wildlife includes a number of species of invertebrates, reptiles and amphibians, birds, and mammals (terrestrial and aquatic). Common aquatic resources include many species of fish, shellfish, and mollusks. Common plant communities include non-native annual grassland and landscaped areas/ornamental plants. Common species and habitats would be affected through the removal and construction of buildings, removal of trees, shoreline improvements, installation of trails, roads, and other facilities, construction and operation of the stadium and Yosemite Slough bridge, increased foot and vehicular traffic, installation of towers, and operation of stadium lights. In addition, an increase in trash, particularly food waste, could potentially subsidize nuisance species such as common ravens (*Corvus corax*), American crows (*Corvus brachyrhynchos*), raccoons, rats, and feral cats, which in turn could increase predation on more sensitive wildlife species. As a result, some common habitats would be reduced in extent, and some common species would decline in abundance as a result of the Project. However, the Project's impact to common species and habitats would not be substantial. These species/habitats are abundant throughout the San Francisco Bay region, and the Project site supports an extremely small proportion of the regional abundance of these resources. Further, the abundance of many of these species on the Project site itself is relatively low due to the extent of developed/urban land uses on the site, the long history of disturbance of the site, the intensive nature of such disturbance in some areas (e.g., where remediation activities on HPS are occurring or have recently occurred), and the site's isolation from more extensive areas of natural habitat by the Bay and by urban development in surrounding areas. Those species that are present on the site in higher numbers consist primarily of species that are well adapted to urban or heavily disturbed areas. Consequently, any impacts of the Project on common species and habitats would have a negligible effect on regional population and would thus be less than significant. No mitigation is required.

The habitat disturbance caused by the Project would result in a less-than-significant impact to regionally common species and habitats, and, in addition, the Project proposes multiple measures to further avoid and minimize impacts to common vegetation communities and wildlife species, and to enhance habitat conditions for a number of species, such as migratory birds. Specifically, the Project includes implementation of a Draft Parks, Open Space, and Habitat Concept Plan[793] (provided in Appendix N3 [Draft Parks, Open Space, and Habitat Concept Plan] to this EIR) that would take advantage of opportunities for enhancing the ecological functions and values of the parks and open space areas on the Project site. These enhancement measures would focus on areas outside the CPSRA, since the Project would neither impact directly, nor have control over enhancements in, the portion of the CPSRA that is not subject to the land transfer agreement. However, the Draft Parks, Open Space, and Habitat Concept Plan would suggest enhancements that would provide ecological benefits within the CPSRA, should State Parks decide to implement them. Some of the measures that would be included in the Draft Parks, Open Space, and Habitat Concept Plan, and that would be implemented on the Project site, include:

- **Control of non-native invasive species:** The Project site is currently dominated by non-native plants, and several are particularly invasive, having the potential to expand over large areas and significantly reduce the ecological value provided by the proposed habitat enhancements. Invasive, non-native species would be removed during initial habitat enhancement efforts, and monitoring and ongoing removal/control would be implemented to ensure against the re-establishment and spread of these species on the Project site.
- **Restoration of grasslands:** To maintain grassland-associated wildlife species on the site, grasslands extensive enough to support such species would be maintained and enhanced through the restoration of native grasses. Such grassland habitat would not be well manicured or regularly mown. No trees would be planted within designated grassland management areas, and shrub cover would be limited to a few small, scattered patches of low-statured coastal scrub plants, which will provide cover for wildlife that may otherwise forage in the grasslands. Native-dominated grassland habitat would be created, which would result in a net gain for the site.
- **Increase in tree/shrub cover:** Numerous trees (approximately 10,000 net new trees, which is more than four times the number currently present on the Project site) and shrubs (particularly natives) would be planted and maintained to provide cover for mammals, reptiles, and amphibians and enhance habitat suitability for birds. The trees would be planted at the Project site and in the community, and the shrubs would be planted at the Project site. Trees and shrubs would be particularly beneficial as foraging habitat for Neotropical and other long-distance migrant birds. Increases in foliage height diversity and vegetation volume resulting from the planting of numerous trees and shrubs on the site, most of which currently supports little woody vegetation, would result in increases in the diversity and abundance of breeding and migratory birds. While native vegetation shall be favored, site-appropriate non-native trees and shrubs that provide food or structural resources that are particularly valuable to native wildlife may also be considered.
- **Maintenance of habitat connectivity:** Roads, trails, and buildings would interrupt habitat connectivity to some extent. However, park planning and maintenance/landscaping of open space areas can maintain connectivity within the site for less mobile animals such as mammals, reptiles, and amphibians through the wildlife-friendly design of potential obstacles (i.e., fences, walls, and curbs), maintenance of a vegetated band along the shoreline, and planting of vegetative cover that provides refugia for dispersing animals.

[793] Lennar Urban, *Draft Parks, Open Space, and Habitat Concept Plan,* November 2009.

- **Maintenance of refugia for waterbirds:** In planning for future trails, vistas, and other features/facilities expected to concentrate human activities along the waterfront, at least one shoreline area where waterbirds can roost at high tide would remain removed from trails or other shoreline access points for humans. In addition, the bases of the three piers in the southeastern corner of HPS Phase II would be removed to prevent mammals from accessing these piers, and the piers would be left in place to provide roosting sites for gulls, cormorants, pelicans, and terns.
- **Provision of nest boxes:** Nest boxes for birds would be placed in appropriate locations throughout parks and open space areas.

With implementation of the Draft Parks, Open Space, and Habitat Concept Plan, many wildlife species would benefit from the removal of invasive species, enhancement, restoration, and management of habitats such as grasslands and wetlands, and the planting of numerous trees and shrubs in areas that are currently highly degraded or disturbed. Specifically, extensive planting of native vegetation would enhance the vegetation community and provide areas of enhanced habitat for common butterflies, birds, small mammals, reptiles, and amphibians on the Project site. For most species, the benefits of such enhancements would accrue to local, rather than regional, populations, as there is no substantive dispersal of most wildlife species between the site and off-site areas. However, in the case of migratory birds, the Project would result in a net benefit that would have regional or Flyway-level implications, as the Project would enhance foraging habitat that is used by birds breeding and wintering in areas far from the Study Area. Further, the Draft Parks, Open Space, and Habitat Concept Plan would identify enhancement opportunities within open space areas that can be beneficial to other common species or habitats. A discussion of potential effects of the Project on common species by wildlife type is included below.

Invertebrates

Of 14 butterfly species recorded on the Project site during the Yosemite Slough Watershed Wildlife Survey, 13 species are common and widespread and are associated with host plants that are also widespread. These butterflies would benefit from increased habitat and foraging opportunities within the proposed native habitats and landscaping plantings as a result of the Project. The western pygmy blue, which was recorded infrequently (no more than one individual on a given survey), is associated with salt marshes and is, therefore, of more limited distribution. Nevertheless, this species is found in salt marshes throughout the San Francisco Bay area and was recorded very infrequently during the Yosemite Slough Watershed Wildlife Survey. As a result, the Project would have a negligible effect on regional populations of the species, and impacts to this and other butterfly species would be less than significant. The Project would maintain and enhance habitat for the pygmy blue through restoration, creation, or enhancement of salt marsh habitat along the shoreline. As a result of salt marsh restoration on the outboard side of revetments on portions of Candlestick Point and HPS Phase II, the Project is expected to create at least as much salt marsh habitat as it impacts.

Reptiles and Amphibians

The Project would maintain habitat for all five of the reptiles (southern alligator lizard, western fence lizard, gopher snake, ring-necked snake, and western garter snake) and the single amphibian (California slender salamander) recorded on the Project site by the Yosemite Slough Watershed Wildlife Survey. Providing additional ground cover (i.e., shrubs) would improve habitat in some areas, especially in HPS Phase II, which has been subjected to intensive disturbance from remediation efforts.

Local abundance of these species may decline in some areas due to a reduction in dispersal (resulting from trails, roads, and increased vehicular traffic and human presence) and possibly increased vehicular mortality, but all six of these species are regionally abundant, and the Project's impacts would have a negligible effect on regional populations. In addition, the new and improved parkland components of the Project would provide new and/or enhanced habitat for reptiles and amphibians, which would be a localized beneficial impact in portions of the site.

Birds

Of 118 bird species observed during the Yosemite Slough Watershed Wildlife Survey, 51 (43 percent) were represented by a maximum count (the maximum number of individuals recorded on a given survey) of 5 or fewer, and thus use the Project site in low numbers. The most abundant wildlife species recorded were waterbirds. Project impacts to waterbird habitat within the Yosemite Slough bridge footprint would be mitigated by restoration on site or off site, as discussed under mitigation measure MM BI-4a.1 below. Increased human use of the Project site may reduce abundance in aquatic habitats along the immediate shoreline, but ample aquatic habitat is present around the Project site, and, even without restoration, no substantial changes in common waterbird abundance (particularly relative to regional populations) are expected as a result of the Project.

Of the 57 species of landbirds recorded, only 20 were represented by maximum counts of 10 or more, indicating that most landbirds use the study area only in low numbers. In addition, most of these species are regionally abundant species adapted to a variety of habitat types, including the disturbed, non-native dominated habitats that currently occupy most of Candlestick Point and HPS Phase II. Although many landbird species would increase in abundance due to the provision of much more extensive trees and shrubs than are currently present, a few regionally abundant landbirds associated with extensive grasslands and weedy areas (such as meadowlarks and wintering grassland sparrows) may fluctuate in abundance within the Project site. However, incorporation of grasslands in open space areas and restoration of suitable foraging habitat on portions of the Project site would maintain habitat for these species on the site by ensuring that there is habitat for small birds, reptiles, mammals, and insects, which are the primary prey for the locally occurring raptor species.

The Project would result in a net benefit to many avian species. The Project would include approximately 105 acres and 232 acres of parkland and open space improvements at Candlestick Point and HPS Phase II, respectively. Although portions of this parkland may serve primarily recreational purposes, parks in the Project area would provide an opportunity for planting of trees and shrubs that would be used by numerous birds. For example, the 82-acre[794] Grasslands Ecology Park on the southern portion of HPS would be designed and landscaped to provide a variety of habitats, including extensive grasslands as well as a mosaic of trees, shrubs, and other vegetation. A Draft Parks, Open Space, and Habitat Concept Plan, which is required by mitigation measure MM BI-7b below, would include the planting of approximately 10,000 net new trees (more than four times the number currently present in the Project area), in addition to shrubs and other vegetation, which would serve as perching, roosting, nesting, and foraging sites for a variety of birds. The trees would be planted at the Project site and in the community, and the shrubs would be planted

[794] This acreage reflects the area of parklands that would be suitable for on-site species, and represent only a portion of the total new park lands that would be created by the Project.

at the Project site. These new and improved Project components would provide both raptor foraging opportunities and enhanced habitat for certain raptor prey species that could result in higher prey base for raptors. Some waterbirds (i.e., gulls, terns, cormorants, and pelicans) would benefit from the enhanced roost sites offered by the proposed three piers, which would provide nesting and roosting sites that would no longer accessible to mammalian predators. Neotropical and other long-distance migrants, the landbird group using the site that is of greatest conservation concern, would receive a considerable net benefit from the Project. Increases in foliage height diversity and vegetation volume resulting from the planting of numerous trees and shrubs on the site, most of which currently supports little woody vegetation, would result in increases in the diversity and abundance of both breeding and migratory birds.[795,796,797] Well-vegetated sites nearby, such as Golden Gate Park and Coyote Point, provide much higher density and structural diversity of vegetation than is currently present on HPS Phase II and most of Candlestick Point, and these locations are known by birders to support high species diversity and abundance of birds, including Neotropical and other long-distance migrants.[798] With the Project's revegetation component and addition of new parklands, the Project would provide a net enhancement of breeding, wintering, and migratory stopover habitat for birds.

Mammals

Of the ten mammal species recorded in the Study Area during the Yosemite Slough Watershed Wildlife Survey, three are non-natives (domestic dog, domestic cat, and Norway rat); two are common urban-adapted species (raccoon and striped skunk); and one occurs infrequently in aquatic areas (harbor seal). Of the remaining four species, the Botta's pocket gopher and California vole were represented by no more than one individual on a given survey and thus may be uncommon on the site. These two species, and the California ground squirrel and black-tailed jackrabbit, may decline in abundance on portions of Candlestick Point as extensive weedy/grassland habitats are converted to a mosaic of uses and habitats. However, numbers of these species in open space in HPS Phase II are currently expected to be low due to disturbance from remediation efforts, and enhancement and management of grassland habitat in this area may increase numbers of these species there. Specifically, habitat values on southern HPS Phase II, which has been heavily impacted by remediation efforts, would be enhanced considerably by management of a diverse mosaic of habitats, including native-dominated grasslands and patches of native and site-appropriate trees and shrubs. This area would, therefore, provide new and substantially improved habitat that small mammals can utilize and occupy.

Over time, numbers of some of these small-mammal species may decline due to a reduction in dispersal between patches of suitable grassland habitat and increased urbanization, but all of the terrestrial mammals on the site are regionally abundant and the reduction in their numbers within the site would have a negligible effect on regional populations. The Project would include approximately 105 acres and 232 acres of parkland and open space improvements on Candlestick Point and HPS Phase II, respectively. Although portions of this parkland may serve primarily recreational purposes, parks in the Project area would provide

795 MacArthur, R. H. and J. W. MacArthur. 1961. On bird species diversity. Ecology 42:594-598.
796 Karr, J. R. 1968. Habitat and avian diversity on strip-mined land in east-central Illinois. Condor 70:348-357.
797 Mills, G. S., J. B. Dunning, Jr., and J. M. Bates. 1991. The relationship between breeding bird density and vegetation volume. Wilson Bulletin 103:468-479.
798 Richer, C. (ed.) 1996. *San Francisco Peninsula Birdwatching*. Sequoia Audubon Society.

an opportunity for planting of vegetation that would provide cover and other resources for use by mammals. The Project would include an 82-acre[799] Grassland Ecology Park that would, at a minimum, contain 43 acres of native-dominated grassland habitat. This grassland would be managed specifically for grassland-associated species, providing enhanced native habitat and foraging opportunities for several mammal species. These new and improved Project components (as implemented through mitigation measure MM BI-7b) would provide new and/or enhanced habitat conditions for small and medium-sized mammals, which would be a beneficial impact.

Fish, Shellfish, and Mollusks

Although no formal fish surveys have been performed, many areas of open water support an array of common estuarine/marine species from encrusting tunicates, sponges, and algae to bottom-dwelling fish (halibut, flounder, and sole), to more open water fish like anchovies, herring, and sardines. Under the worst-case scenario, the Project would affect approximately 29 acres of aquatic habitat, which would have the potential to affect these common species both directly through mortality of individuals or loss of habitat and indirectly through mechanisms such as increased competition, decreased water quality or other common impacts associated with in-water construction. However, the San Francisco Bay is approximately 400 square miles in area, and many of the common species that would be affected by the Project would have ample areas to relocate to. Those individuals that would experience direct mortality represent a very small proportion of the regional populations of these common species. Consequently, the Project's impacts would have a negligible effect on regional populations of common fish and aquatic invertebrates (however, refer to Impact BI-12a and Impact BI-12b below regarding impacts to EFH).

Impact BI-3: Sensitive Plants

Impact of Candlestick Point

Impact BI-3a **Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No impact)** ***[Criteria N.a and N.b]***

Candlestick Point is largely developed. Those areas not developed are highly modified and support only ruderal (disturbed) habitats and ornamental landscaping. Most vegetation in the area has been introduced as landscape plants and turf grass or consists of weedy, non-native species that readily colonize recently disturbed areas. Special-status plants were not observed during any of the focused botanical surveys in 2007 or 2008.[800] Disturbances include: a lack of natural fire regimes (largely since Euro-American settlement); construction of Candlestick Park stadium and associated roads and parking areas; development of CPSRA; increasing competition from invasive non-native species; and on-going disturbances such as vegetation management, trash, and pedestrian traffic. These disturbances have resulted in urbanization of almost all of Candlestick Point. The remaining vegetated areas have been reduced in quality. Because no

[799] This acreage reflects the area of parklands that would be suitable for on-site species and represent only a portion of the total new park lands that would be created by the Project.
[800] Caltrans, Natural Environmental Study Report for the Bayview Transportation Improvements Project, Jones and Stokes, July 2007.

special-status plants have been observed and the site generally does not support the preferred or required soils (i.e., serpentine) needed to support special-status plant species, sensitive plant species are considered absent from Candlestick Point. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-3b **Construction at HPS Phase II and construction of the Yosemite Slough bridge would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No impact)** ***[Criteria N.a and N.b]***

HPS Phase II is dominated by industrial and developed areas. The southern shoreline of HPS Phase II and the bridge footprint area is a mixture of salt marsh, seasonal brackish marsh, freshwater seasonal wetland, and non-native annual grassland. Special-status plants were not observed during any of the focused botanical or rare plant surveys in 2007 or 2008.[801] Factors limiting rare plant occurrences within this area include: a lack of natural fire regimes (largely since Euro-American settlement); early maritime development; and construction of a World War II-era Shipyard, as well as post-war development. Those actions have resulted in urbanization of almost all of HPS Phase II. Because no special-status plants have been observed and the site generally does not support the preferred or required soils (i.e., serpentine) needed to support special-status plant species, sensitive plant species are considered absent from HPS Phase II and Yosemite Slough bridge areas. Therefore, no impact would occur, and no mitigation is required.

Impact BI-4: Sensitive Vegetation Communities: Waters of the United States and Navigable Waters

Impact of Candlestick Point

Impact BI-4a **Construction at Candlestick Point would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation)** ***[Criterion N.c]***

As detailed in Table III.N-4 (Impacts to Wetlands and Other Jurisdictional Waters of the United States [Section 404]) and depicted in Figure III.N-5 (Impacts to Wetlands and Other Waters), through site grading, materials laydown, facilities construction, vegetation removal, and installation of shoreline treatments, Project activities at Candlestick Point would permanently impact 0.29 acre of tidal salt marsh and 4.34 acres of Section 404 "other waters", relative to existing conditions (i.e., prior to completion of remediation efforts by the Navy). Both wetlands and mud flats, the latter comprising a subset of Section 404 "other waters," are considered Special Aquatic Sites under *Clean Water Act* Section 404. It would also temporarily impact 0.01 acre of tidal salt marsh and 0.64 acre of Section 404 "other waters", relative to existing conditions. Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace those habitats in the same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

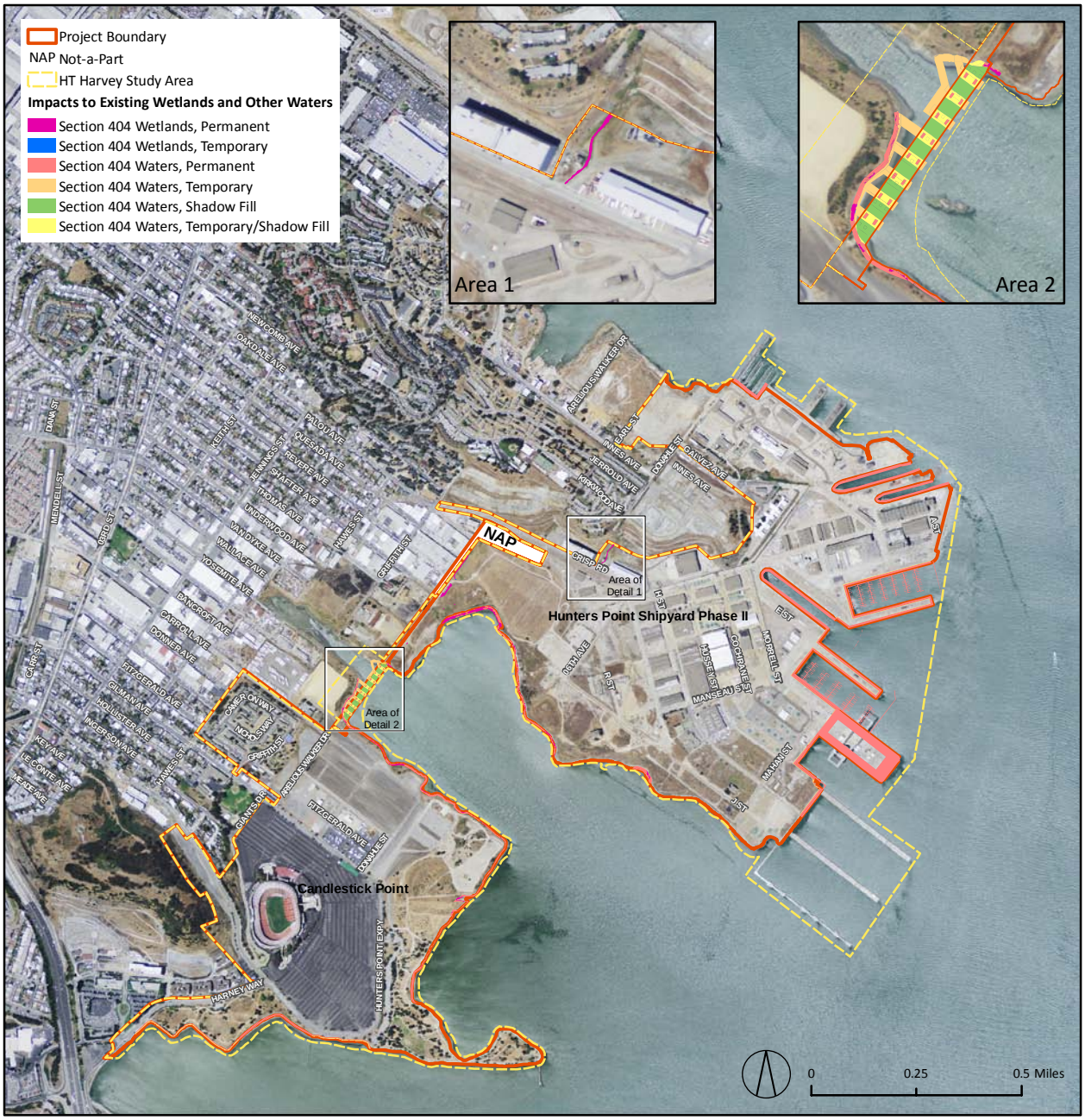
[801] Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

Table III.N-4 Impacts to Wetlands and Other Jurisdictional Waters of the United States (Section 404)

Jurisdictional Feature (Waters of the United States)	*Area*				*Yosemite Slough*						
	Candlestick Point		*HPS Phase II*		*On Site*		*Off Site*				
	Temporary Impacts	*Permanent Impacts*	*Temporary Impacts*	*Permanent Impacts*	*Temporary Impacts*	*Permanent Impacts*	*Temporary Impacts*	*Permanent Impacts*	*Temporary Totals*	*Permanent Totals*	*Grand Totals*[a]
Freshwater Wetland	—	—	—	0.17	—	—	—	—	—	0.17	0.17
Non-tidal Salt Marsh	—	—	—	0.15	—	—	—	—	—	0.15	0.15
Tidal Salt Marsh	0.01	0.29	—	0.09	—	0.01	<0.01 (40 sf)	0.03	0.01	0.42	0.43
"Other Waters"	0.64	4.34	0.85	20.26	0.53	0.18	0.75	0.19	2.76	24.97	27.73
Totals for Impacted Section 404 Jurisdictional Features	***0.65***	***4.63***	***0.85***	***20.67***	***0.53***	***0.19***	***0.75***	***0.22***	***2.77***	***25.71***	***28.48***

SOURCES: H.T. Harvey & Associates, *Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California*, February 2009 and revised July 13 and October 13, 2009.
MACTEC. *Work Program for the Construction of the Yosemite Slough Bridge Corridor*, March 2010.

a. Totals may not add up due to rounding.



SOURCE: HT Harvey, 2010; Moffat & Nichol, 2009; Mactech, 2010; PBS&J, 2010. PBS&J 04.19.10

FIGURE III.N-5 ~~Candlestick Point - Hunters Point Shipyard Phase II EIR~>
IMPACTS TO WETLANDS AND OTHER WATERS

Shoreline improvements at Candlestick Point would result in the removal of approximately 2.86 acres of fill, and the placement of approximately 3.46 acres of fill. A net decrease of approximately 0.42 acre of open waters would occur at Candlestick Point. These impacts would occur entirely along the Candlestick Point shoreline as a result of construction of revetments to minimize flooding and shoreline erosion, and as a result of the placement of soils or sand to enhance beach or marsh habitat. For example, along most of the northern and southern edges of Candlestick Point, marsh soils would be placed in jurisdictional areas following completion of the revetment to provide a gentler slope than is currently present, which would allow for colonization by marsh vegetation. As a result, much of the fill of jurisdictional areas (as reflected in Table III.N-4 and Figure III.N-5) would result in an enhancement of habitat and, thus, would be self-mitigating.

In addition to the direct removal of wetlands and other waters, construction in or adjacent to the Bay in the wetlands could also result in indirect impacts such as increased erosion and sedimentation into and hydrologic disruption of wetlands and jurisdictional waters, decreased water quality from construction runoff and potential construction contaminants including oil, grease and fuel, and temporary decrease in habitat functions and values through hydrological disruption or elevated disturbance. However, construction of shoreline revetments would reduce erosion and turbidity in the long term by addressing existing problems with shoreline erosion.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands and other waters that would result in a net loss of these areas would be considered a significant impact. However, any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbor's Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Additionally, runoff produced during and after construction is subject to National Pollution Discharge Elimination System (NPDES) Regulations and local water quality and runoff standards.

To reduce impacts to wetlands and jurisdictional waters, the following mitigation measures shall be implemented:

MM BI-4a.1 *Wetlands and Jurisdictional/Regulated Waters Mitigation for Temporary and/or Permanent Impacts. Wetlands and jurisdictional waters shall be avoided to the maximum extent practicable for all Project components. For example, any measures taken to improve the existing shoreline of Candlestick Point or HPS Phase II for purposes of flood control, erosion control, or repair or stabilization of existing structures shall minimize the amount of fill to be placed in jurisdictional areas.*

Where avoidance of existing wetlands and drainages is not feasible, and before any construction activities are initiated in jurisdictional areas, the Applicant shall obtain the following permits, as applicable to the activities in question:

- *CWA Section 404 permit from the USACE.*
- *Section 10* Rivers and Harbors Act *Permit from the USACE.*
- *CWA Section 401 water quality certification from the RWQCB, and/or Report of Waste Discharge for Waters of the State.*
- *CWA Section 402/National Pollution Discharge Elimination System permit from SWRCB [requiring preparation of a Stormwater Pollution Prevention Plan (SWPPP)].*

- *CDFG Section 1602 streambed alteration agreement from CDFG.*
- *A permit from the BCDC.*
- *Dredging permits from the USACE and BCDC as required, obtained through the Dredged Material Management Office (DMMO) process.*

Copies of these permits shall be provided to the contractor, along with the construction specifications. The Project Applicant shall be responsible for complying with all of the conditions set forth in these permits, including any financial responsibilities.

Compensation for impacts to wetlands and jurisdictional waters shall be required to mitigate any permanent impacts to these habitats to less-than significant-levels. Such mitigation shall also be developed (separately from the CEQA process) as a part of the permitting process with the USACE, or for non-USACE-jurisdictional wetlands, during permitting through the SFRWQCB, BCDC, and/or CDFG. The exact mitigation ratio shall be established during the permitting process, and depends on a number of factors, including the type and value of the wetlands permanently affected by the Project; however, mitigation shall be provided at a ratio of no less than 1:1 (at least 1 acre of mitigation for every 1 acre of waters of the US/State permanently filled). Mitigation could be achieved through a combination of on-site restoration or creation of wetlands or aquatic habitats (including removal of on-site fill or structures such as piers, resulting in a gain of wetland or aquatic habitats); off-site restoration/creation; and/or mitigation credits purchased at mitigation banks within the San Francisco Bay Region. However, any mitigation for impacts to jurisdictional waters providing habitat for special-status fish such as the green sturgeon, Central California Coast steelhead, Chinook salmon, and longfin smelt must result in the restoration or creation (at a minimum 1:1 ratio) of suitable habitat for these species, and any mitigation for impacts to jurisdictional wetlands or other waters that are considered EFH by the NMFS must result in the restoration or creation (at a minimum 1:1 ratio) of EFH. Suitably planned mitigation sites may satisfy mitigation requirements for jurisdictional areas, special-status fish, and EFH simultaneously (i.e., in the same mitigation areas) if the mitigation satisfies all these needs.

For funding of off-site improvements or purchase of mitigation bank credits, the Project Applicant shall provide written evidence to the City/Agency that either (a) compensation has been established through the purchase of a sufficient number of mitigation credits to satisfy the mitigation acreage requirements of the Project activity, or (b) funds sufficient for the restoration of the mitigation acreage requirements of the Project activity have been paid to the BCDC, CCC, or other entity or agency that offers mitigation credits in the San Francisco Bay Area.

For areas to be restored, to mitigate for temporary or permanent impacts, the Project Applicant shall prepare and implement a Wetland and Jurisdictional Waters Mitigation Monitoring Plan (Mitigation Monitoring Plan). The Plan shall be submitted to the regulatory agencies along with permit application materials for approval, along with a copy to the City/Agency.

The Project Applicant shall retain a restoration ecologist or wetland biologist to develop the Wetland and Jurisdictional Waters Mitigation and Monitoring Plan, and it shall contain the following components (or as otherwise modified by regulatory agency permitting conditions):

1. *Summary of habitat impacts and proposed mitigation ratios, along with a description of any other mitigation strategies used to achieve the overall mitigation ratios, such as funding of off-site improvements and/or purchase of mitigation bank credits*
2. *Goal of the restoration to achieve no net loss of habitat functions and values*
3. *Location of mitigation site(s) and description of existing site conditions*

4. *Mitigation design:*
   - *Existing and proposed site hydrology*
   - *Grading plan if appropriate, including bank stabilization or other site stabilization features*
   - *Soil amendments and other site preparation elements as appropriate*
   - *Planting plan*
   - *Irrigation and maintenance plan*
   - *Remedial measures/adaptive management, etc.*
5. *Monitoring plan (including final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.)*
6. *Contingency plan for mitigation elements that do not meet performance or final success criteria.*

Restoration and/or creation of wetlands or aquatic habitats could occur on site or off site and at one or more locations, as approved by the regulatory agencies. Impacts occurring due to activities on Candlestick Point may be mitigated by restoration or creation activities on HPS Phase II and vice versa. For example, loss of open water habitat that might result from construction of shoreline treatments could potentially be mitigated by the removal of fill or structures from aquatic habitat on HPS Phase II.

The Project Applicant, or its agent, shall implement the Wetland and Jurisdictional Waters Mitigation Monitoring Plan. At least five years of monitoring (or more if required as a condition of the permits) shall be conducted to document whether the success criteria (that are determined as part of the mitigation plan) are achieved, and to identify any remedial actions that must be taken if the identified success criteria are not met. Annual monitoring reports (described below) shall be submitted to CDFG, the USACE, the BCDC, the City/Agency, and the SFRWQCB. Each report shall summarize data collected during the monitoring period, describe how the habitats are progressing in terms of the success criteria, and discuss any remedial actions performed. Additional reporting requirements imposed by permit conditions shall be incorporated into the Wetland and Jurisdictional Waters Mitigation Monitoring Plan and implemented.

Success criteria for specified years of monitoring for vegetated mitigation wetlands are as follows (though these may be subject to change pending development of specific Mitigation and Monitoring Plans and consultation during the permit process):

- *Year 1 after restored areas reach elevations suitable for colonization by wetland plants: 10 percent combined area and basal cover (rhizomatous turf) of all vegetation in the preserve wetland; at least two hydrophytic plants co-dominant with whatever other vegetative cover exists.*
- *Year 3 after restored areas reach colonization elevation: 50 percent combined area and basal cover (rhizomatous turf) of all vegetation; prevalence of hydrophytic species in terms of both cover and dominant species composition of the vegetation; native vascular species shall comprise 95 percent of the vegetation in the preserve wetland.*
- *Year 5 after restored areas reach colonization elevation: 70 percent combined area and basal cover (rhizomatous turf) of all vegetation; more than 50 percent dominance in terms of both cover and species composition of facultative (FAC), facultative wetland (FACW), and obligate (OBL) species; native vascular species shall comprise 95 percent of the vegetation in the preserve wetlands.*

Other success criteria shall be developed for open water/mud flat habitats (which would not be expected to support vegetation) or for wetland complexes specifically designed to contain extensive areas of channels, pannes, or flats that would not be vegetated. In addition, the final Project design shall avoid substantial

adverse effects to the pre-Project hydrology, water quality, or water quantity in any wetland that is to be retained on site. This shall be accomplished by avoiding or repairing any disturbance to the hydrologic conditions supporting these wetlands, as verified through an on-site Wetland Protection Plan that shall be prepared by a restoration ecologist or wetland biologist that is retained by the Project Applicant, and submitted to regulatory agencies for approval, along with a copy to the City/Agency. If such indirect effects cannot be avoided, compensatory mitigation shall be provided for the indirectly affected wetlands at a minimum 1:1 ratio, as described above. Mitigation for indirectly impacted wetlands shall be described in the Wetland and Jurisdictional Waters Mitigation and Monitoring Plan.

Project features resulting in impacts to open water areas as a result of the marina, bridge, and breakwater construction shall be designed to be the minimum size required to meet their designated need. The opening in the breakwater shall be large enough and positioned such that it would allow for a complete daily exchange of water within the marina that would otherwise result from normal tidal flow, as determined by a coastal engineer and an aquatic biologist. This opening shall be designed to minimize disruption to the local hydrology generated by the breakwater and allow for normal tidal flow to ensure the daily exchange of nutrients.

MM BI-4a.2 *Wetlands and Jurisdictional/Regulated Waters Impact Minimization for Construction-Related Impacts. The Project Applicant shall ensure that the contractor minimizes indirect construction-related impacts on wetlands and jurisdictional/regulated waters throughout the Study Area by implementing the following Best Management Practices (BMPs):*

- *Prior to any construction activities on the site, a protective fence shall be installed a minimum of one foot (or greater, if feasible) from the edge of all wetland habitat to be avoided in the immediate vicinity of the proposed construction areas. Prior to initiation of construction activities, a qualified biologist shall inspect the protective fencing to ensure that all wetland features have been appropriately protected. No encroachment into fenced areas shall be permitted during construction and the fence shall remain in place until all construction activities within 50 feet of the protected feature have been completed.*
- *Construction inspectors shall routinely inspect protected areas to ensure that protective measures remain in place and effective until all construction activities near the protected resource have been completed. The fencing shall be removed immediately following construction activities.*
- *To maintain hydrologic connections, the Project design shall include culverts for all seasonal and perennial drainages that are waters of the United States and/or Waters of the State.*
- *Sediment mitigation measures shall be in place prior to the onset of Project construction and shall be monitored and maintained until construction activities have been completed. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas. Excess excavated soil shall be disposed of at a regional landfill or at another approved and/or properly permitted location. Stockpiles that are to remain on the site throughout the wet season shall be protected to prevent erosion.*
- *Where determined necessary by regulatory agencies, geotextile cushions and other appropriate materials (i.e., timber pads, prefabricated equipment pads, geotextile fabric) shall be used in saturated conditions to minimize damage to the substrate and vegetation.*
- *Exposed slopes and banks shall be stabilized immediately following completion of construction activities to reduce the effects of erosion on the drainage system.*
- *In highly erodible areas, such as Yosemite Slough, banks shall be stabilized using a non-vegetative material that shall bind the soil initially and break down within a few years. If, during review of*

the grading permit for this area, the City/Agency determines that more aggressive erosion control treatments are needed, the contractor shall be directed to use geotextile mats, excelsior blankets, or other soil stabilization products.

- *The contractors shall develop a Storm Water Pollution Prevention Plan (SWPPP) prior to construction. As discussed in the Regulatory Framework of the Hydrology and Water Quality section of this EIR, the SWPPP will comply with applicable local, state, and federal requirements. Erosion control BMPs may include, but are not limited to, the application of straw mulch; seeding with fast growing grasses; construction of berms, silt fences, hay bale dikes, stormwater detention basins, and other energy dissipaters. BMPs shall be selected and implemented to ensure that contaminants are prevented from entering the San Francisco Bay during construction and operation of the facilities shall protect water quality and the marine species in accordance with all regulatory standards and requirements.*
- *Testing and disposal of any dredged sediment shall be conducted as required by the USACE and the Long-Term Management Strategy (LTMS)*[802]
- *All temporarily impacted wetlands and other jurisdictional waters, whether in tidal or non-tidal areas, shall be restored to pre-construction contours following construction. Such impact areas include areas that are dewatered (e.g., using coffer dams) and/or used for construction access. Temporarily impacted wetlands that were vegetated prior to construction shall be revegetated in accordance with a Wetlands and Jurisdictional Water Mitigation and Monitoring Plan as described above.*
- *For impacts to tidal habitats:*
  - *Conduct all work in dewatered work areas*
  - *Install sediment curtains around the worksite to minimize sediment transport*
  - *Work only during periods of slack, tide (minimal current) and low wind to minimize transport of sediment laden water*

Implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. Consequently, implementation of these mitigation measures would reduce potential adverse effects to wetlands and jurisdictional waters to less-than-significant levels.

[802] US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001.

Impact of Hunters Point Shipyard Phase II

Impact BI-4b **Construction at HPS Phase II would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) *[Criterion N.c]***

As detailed in Table III.N-4 and depicted in Figure III.N-5, through site grading, materials laydown, facilities construction, vegetation removal, installation of shoreline treatments, and construction of the marina, Project activities at HPS Phase II would permanently impact existing wetlands and other waters as follows: 0.17 acre of nontidal freshwater wetland, 0.09 acre of tidal salt marsh, 0.15 acre of non-tidal salt marsh, and 20.26 acres of Section 404 other waters. It would also temporarily impact 0.85 acre of Section 404 other waters. Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace them in the same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

For the purpose of discussing all project activities that could affect aquatic habitats, impacts to open waters that will result from the removal of existing structures (such as pier headwalls) are considered permanent impacts, since there will be some fill placed within the new open water/intertidal habitat for slope stabilization or restoration purposes after the existing structures are removed. However, such an approach to impact estimation is very conservative, as these activities will result in ecological enhancements by creating new aquatic habitat where none currently exists. As discussed in greater detail below, nearly 10 acres of the total 21.52 acres of impacts to jurisdictional areas on HPS Phase II would result from activities that would enhance ecological conditions along the HPS shoreline.

As mentioned for Candlestick Point above, the impact to tidal salt marsh, Section 404 other waters along the southern shoreline of HPS would occur primarily as a result of the placement of soils along the shoreline to enhance marsh habitat. Following the completion of a revetment by the Navy, the Project Applicant would enhance the revetment as needed (e.g., for aesthetics or to allow it to be more easily raised in the event of sea level rise). However, work to enhance the revetment simply for improved flood control or aesthetics is not expected to result in additional impacts to jurisdictional areas. Rather, the CP/HPS Project would add soil or other materials on the outboard side of the revetment to facilitate the creation of tidal salt marsh in several areas along the southern shoreline of HPS by reducing the revetment's slope and providing a more suitable substrate for colonization by wetland vegetation. As a result, most of the fill of jurisdictional areas (as reflected in Table III.N-4 and Figure III.N-5) along the southern shoreline of HPS (about 1.9 acres of the total acreage impacted at HPS) would result in an enhancement of habitat and, thus, would be self-mitigating.

It is possible that the Yosemite Slough Bridge and its approaches may be constructed before the Navy has completed remediation efforts (including mitigation for its impacts to wetlands) on Parcel E-2. In that case, construction of the bridge and its approaches would impact whatever wetlands have not yet been disturbed, or created, by the Navy, which may include some of the wetlands in the southwestern portion of Parcel E-2 that are included in Table III.N-4 and shown in Figure III.N-5. However, the majority of the non-tidal salt marsh in the southwestern portion of Parcel E-2 would not be impacted by the CP/HPS Project, whether the Navy has completed its remediation efforts or not. If the Navy completes its remediation and construction of its mitigation wetlands before the bridge and its approaches are constructed, then virtually all

of the currently existing wetlands on Parcels E and E-2 (including the approximately 1.8 acres of nontidal wetlands not affected by the Project) would have been impacted by the Navy's work prior to CP/HPS Project construction. A wetland mitigation site, consisting of a tidal and non-tidal component, has been proposed by the Navy on the southwestern corner of Parcel E-2 (refer to Figure III.N-6 [Proposed HPS Phase II Wetlands]). Portions of this proposed mitigation site cannot be avoided during construction of the bridge and its approaches. Thus, if the Navy's mitigation were constructed in the proposed locations, the bridge and roadway right-of-way would permanently impact approximately 0.0992 acre and temporarily impact 0.1532 acre of wetlands on this mitigation site. The remainder of the mitigation site would not be impacted by the CP/HPS Project, but rather would be preserved and incorporated into the Project area.

Of the 21.52 acres of total impacts to jurisdictional wetlands and other waters of the US that would occur on HPS Phase II, jurisdictional areas that would be completely lost (i.e., converted to non-jurisdictional habitats) total only 2.56 acres. This loss of habitat would occur due to construction of the northern abutment of the Yosemite Slough bridge, along the approach road to the bridge, where a freshwater wetland is located in the west-central part of the site, and where construction of new breakwaters, a floating dock, and a gangway would be placed in the marina. Of the remaining impacts, approximately 8.96 acres would result from fill placed for drydock repairs, buttressing required to support existing pier walls and bulkheads, or other shoreline improvements.

The Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and placement or replacement of fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately 8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS is responsible for approximately 1.9 acres of impacts, nearly 10 acres of the total 21.52 acres of impacts to jurisdictional areas on HPS Phase II would result from activities that would enhance ecological conditions along the HPS shoreline.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands that would result in a net loss of these areas would be considered a substantial adverse effect. In addition, removal of an established mitigation site would also be considered a substantial adverse effect. However, prior to any grading or construction that may impact jurisdictional area(s), any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbors Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Additionally, runoff produced during and after construction is subject to NPDES and local water quality and runoff standards. Lastly, mitigation measures MM BI-4a.1 and MM BI-4a.2 (first discussed in Impact BI-4a) would be implemented to reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional



SOURCE: Yosemite Slough Road Plan, Profile and Sections, Winzler & Kelly, September 2008, MACTEC, 2009. **PBS&J 10.27.2009**

FIGURE III N-6 Candlestick Point - Hunters Point Shipyard Phase II EIR

PROPOSED HPS PHASE II WETLANDS

waters, and implementing construction BMPs to reduce and/or prevent impacts to on waters of the United States, including wetlands and navigable waters. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact of Yosemite Slough Bridge

Impact BI-4c **Construction of the Yosemite Slough bridge would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) *[Criterion N.c]***

The new Yosemite Slough bridge would be a nine-span steel-beam bridge as shown on the MACTEC Engineering and Consulting preliminary draft drawings titled "Yosemite Slough Bridge" (Appendix N2).[803] These plans indicate that the bridge would be approximately 81 feet wide and 902 feet long, and would be supported by 20 steel-pile supported columns and 12 bedrock-supported columns.

As detailed in Table III.N-4 and depicted in Figure III.N-5, bridge construction equipment and materials would be staged at the site in designated lay down areas. Construction access and dewatering would result in temporary impacts to 0.52 acre of Section 404 other waters. It would also result in permanent impacts to 0.01 acre of tidal salt marsh, and 0.18 acre of Section 404 other waters.[804] Construction of the piers' pilings would require the excavation of approximately 2,400 cubic yards of material from the slough; 167 cubic yards of material would be excavated from jurisdictional areas for construction of abutments and installation of riprap at the toe of the north and south bridge abutments.[805]

Temporary off-site impacts (i.e., in portions of Yosemite Slough outside the Project boundary) from construction include less than 0.01 acre of tidal salt marsh, and 0.75 acre of Section 404 other waters. Permanent off-site impacts from construction include 0.03 acre of tidal salt marsh and 0.19 acre of Section 404 other waters. In addition to solid material placed within the Bay, the BCDC considers structures suspended above the Bay or floating on the water to be "fill" and subject to their regulation. The "shadow fill" produced by the Yosemite Slough bridge may change the biological functions and values of aquatic and mud flat habitats below to some extent; such an impact would cover approximately 1.48 acres based on the acreage of mudflat below the immediate bridge surface. Shadow fill would not result in the complete loss of functions and values of the aquatic habitats below, however, and many fish and aquatic organisms would continue to use these areas following bridge construction.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands that would result in a net loss of these areas would be considered a significant impact. However, any alterations of, or discharges into, jurisdictional waters and wetlands must be in conformance with the CWA (via Sections 404 and 401 certification) and Section 10 of the *Rivers and Harbors Act*, as applicable. These regulations are designed to ensure, among other things, that there is no net loss of wetlands and that water

803 MACTEC. Preliminary Draft: Yosemite Slough Bridge, Sheets 1-7, October 2009, which is provided as Appendix N2 to this EIR.
804 Ibid.
805 Ibid.

quality is maintained. Additionally, runoff produced during and after construction is subject to NPDES and local water quality and runoff standard.

Mitigation measure MM BI-4a.1 shall be implemented to compensate for the loss of wetlands and other jurisdictional waters resulting from the Yosemite Slough bridge. For example, permanent fill of such habitats would be compensated by creation or restoration of jurisdictional habitats on or off site, and/or by the purchase of credits in a mitigation bank; such compensation would be performed in conjunction with compensation for impacts to jurisdictional areas on Candlestick Point and HPS. Any vegetated wetlands that are permanently impacted by shading from the bridge would be mitigated in this manner since shading may inhibit vegetation colonization under the bridge after construction is complete. However, shading of 1.48 acres of mud flats and aquatic habitats would have only moderate effects on the functions and values of these habitats and would not result in the loss of these habitats. Mitigation measure MM BI-4a.2 shall be implemented to minimize indirect construction-related impacts on wetlands and other jurisdictional waters. Further, shading impacts to mud flats and aquatic habitats would be reduced by implementation of mitigation measure MM BI-4c.

MM BI-4c *Mitigation for Shading Impacts to Jurisdictional/Regulated Waters. Mud flats and aquatic habitats impacted by permanent shading from the Yosemite Slough bridge shall be mitigated by the creation or restoration, either on site, off site, and/or via purchase of mitigation bank credits, at a 0.5:1 (mitigation:impacted) ratio. Aside from the mitigation ratio, such mitigation shall be provided as described for mitigation measure MM BI-4a.1.*

Mitigation measures MM BI-4a.1 and MM BI-4a.2 (first discussed in Impact BI-4a) would be implemented to reduce the effects of construction-related activities to wetlands by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. In addition, implementation of mitigation measure MM BI-4c would mitigate the impacts of shadow fill to mud flats and aquatic habitats as a result of construction of Yosemite Slough bridge. Consequently, implementation of mitigation measures MM BI-4a.1, MM BI-4a.2, and MM BI-4c would fully mitigate for the temporary and permanent loss of wetlands and jurisdictional waters, and adverse effects would be less than significant.

Impact BI-5: Sensitive Vegetation Communities: Eelgrass Beds

Impact of Candlestick Point

Impact BI-5a **Construction at Candlestick Point would not have a substantial adverse effect on eelgrass beds, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (No Impact) *[Criterion N.b]***

Development at Candlestick Point would require minor in-water work associated with construction of the shoreline treatments. The distribution of eelgrass has been mapped recently and the results of this effort

indicate that no eelgrass beds are found in the near-shore waters of the Candlestick Point peninsula.[806] Therefore, construction activities at Candlestick Point would have no impact on this sensitive resource. No mitigation is required.

Impact of Hunters Point Shipyard Phase II and Yosemite Slough Bridge

Impact BI-5b **Construction at HPS Phase II and construction of the Yosemite Slough bridge would not have a substantial adverse effect on eelgrass beds, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.b]***

Within HPS Phase II a total of 1.99 acres of eelgrass has been mapped at two locations (refer to Figure III.N-2). A small eelgrass occurrence was reported along the north shore of the South Basin directly across from Candlestick Point.[807] The only other reported occurrence of eelgrass within HPS Phase II is on the north shore, east of the northern end of Earl Street.[808] This eelgrass bed extends from the end of Earl Street to the pier that forms Drydock 5. These eelgrass beds are mapped as being below mean sea level and, therefore, are spatially separated from areas where shoreline treatments would occur. There are no mapped eelgrass beds where the marina improvements would occur or where the Yosemite Slough bridge would be constructed. However, because the locations of eelgrass occurrence may vary over time, eelgrass not detected during previous surveys could potentially occur in the shallow waters in or near the Yosemite Slough bridge construction footprint, either now or in the future.

The shoreline improvements associated with HPS Phase II include transforming the revetment edge in wave-protected reaches to a more natural looking shoreline by placing suitable fill to cover the revetment that would be constructed by the Navy, which may include Articulated Concrete Block (ACB) mats and/or marsh soils. Shoreline wave berms may be included along the southwest facing shoreline at the bayward end of the ACB mats. If wave berms or other shoreline improvements, or the Yosemite Slough bridge, were constructed in areas where eelgrass beds exist, they could directly impact them through excavation/removal or placement of fill material. Construction of these features or other shoreline treatments near eelgrass beds could also result in the mobilization of some sediment, which, if it were to settle out on eelgrass, could reduce photosynthesis and, therefore, productivity and survival. Because of the ecological importance but regional scarcity of eelgrass beds and the potential contribution of eelgrass beds in the Study Area to populations of aquatic species (and their predators) throughout larger portions of the Bay, any impacts would be considered a substantial reduction in the local population and, therefore, a substantial adverse effect.

To reduce this impact, the following mitigation measures shall be implemented.

MM BI-5b.1 *Avoidance of Impacts to Eelgrass. As the design of shoreline treatments progresses, and a specific Shoreline Treatment Plan is determined, the Plan shall minimize any in-water construction required for installation of any treatment measures near either of the two eelgrass locations noted above.*

[806] San Francisco Bay Eelgrass Inventory, June-October 2003. Prepared for Caltrans and NOAA Fisheries. Prepared by Merkel and Associates, 2003.
[807] Ibid.
[808] Ibid.

MM BI-5b.2 *Eelgrass Survey. Prior to the initiation of construction of the Yosemite Slough bridge or construction of shoreline treatments, an update to the existing eelgrass mapping shall be conducted to determine the precise locations of the eelgrass beds. For the shoreline treatments, this survey shall occur when a final Shoreline Treatment Plan has been prepared. The survey shall be conducted by a biologist(s) familiar with eelgrass identification and ecology and approved by NMFS to conduct such a survey. The area to be surveyed shall encompass the mapped eelgrass beds, plus a buffer of 750 feet around any in-water construction areas on Hunters Point or associated with the Yosemite Slough bridge. Survey methods shall employ either SCUBA or sufficient grab samples to ensure that the bottom was adequately inventoried. The survey shall occur between August and October and collect data on eelgrass distribution, density, and depth of occurrence for the survey areas. The edges of the eelgrass beds shall be mapped. At the conclusion of the survey a report shall be prepared documenting the survey methods, results, and eelgrass distribution within the survey area. This report shall be submitted to NMFS for approval. The survey data shall feed back into the shoreline treatment design process so that Project engineers can redesign the treatments to avoid or minimize any direct impacts to eelgrass beds.*

If the shoreline treatments can be adjusted so that no direct impacts to eelgrass beds would occur, no further mitigation under this measure would be required for shoreline treatment construction. Management of water quality concerns is addressed through mitigation measure MM BI-5b.4 and shall be required to minimize sediment accumulation on the eelgrass. If direct impacts to eelgrass beds cannot be avoided, either by Hunters Point shoreline treatments or Yosemite Slough bridge construction, mitigation measure MM BI-5b.3 shall be implemented.

MM BI-5b.3 *Compensatory Eelgrass Mitigation. If direct impacts to eelgrass beds cannot be avoided, compensatory mitigation shall be provided in conformance with the Southern California Eelgrass Mitigation Policy. Mitigation shall entail the replacement of impacted eelgrass at a 3:1 (mitigation:impact) ratio on an acreage basis, based on the eelgrass mapping described in mitigation measure MM BI-5b.2 and detailed designs of the feature(s) that would impact eelgrass beds. Such mitigation could occur either off site or on site.[809] Off-site mitigation could be achieved through distribution of a sufficient amount of funding to allow restoration or enhancement of eelgrass beds at another location in the Bay. If this option is selected, all funds shall be distributed to the appropriate state or federal agency or restoration-focused non-governmental agency (i.e., CDFG restoration fund, California Coastal Conservancy, Save the Bay, etc). The Project Applicant shall provide written evidence to the City/Agency that either a) compensation has been established through the purchase of a sufficient number of mitigation credits to satisfy the mitigation acreage requirements of the Project activity, or b) funds sufficient for the restoration of the mitigation acreage requirements of the Project activity have been paid. These funds shall be applied only to eelgrass restoration within the Bay.*

If on-site mitigation is selected as the appropriate option, the Project Applicant shall retain a qualified biologist familiar with eelgrass ecology (as approved by the City/Agency) to prepare and implement a detailed Eelgrass Mitigation Plan. Unless otherwise directed by NMFS, the Eelgrass Mitigation Plan shall follow the basic outline and contain all the components required of the Southern California Eelgrass Mitigation Policy (as revised in 2005),[810] including: identification of the mitigation need, site, transplant methodology, mitigation extent (typically 3:1 on an acreage basis[811]), monitoring protocols (including

[809] NMFS, Southwest Regional Office, Southern California Eelgrass Mitigation Policy, as revised August 30, 2005. Website: http://swr.nmfs.noaa.gov/hcd/policies/EELPOLrev11_final.pdf. Accessed July 20, 2009.
[810] NMFS, Southwest Regional Office, Southern California Eelgrass Mitigation Policy, as revised August 30, 2005. Website: http://swr.nmfs.noaa.gov/hcd/policies/EELPOLrev11_final.pdf. Accessed July 20, 2009.
[811] US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management

frequency, staffing, reviewing agencies, duration, etc), and success criteria. A draft Eelgrass Mitigation Plan shall be submitted to NMFS, for its review and approval prior to implementation, with a copy to the City/Agency. Once the plan has been approved, it shall be implemented in the following appropriate season for transplantation. Restored eelgrass beds shall be monitored for success over a 5-year period.

MM BI-5b.4 *Eelgrass Water Quality BMPs. To prevent sediment that could be suspended during construction from settling out onto eelgrass, for any shoreline treatments within 750 feet of identified eelgrass beds, the Project Applicant shall require the selected contractor to implement appropriate BMPs that could include any or all of the following options, or others deemed appropriate by NMFS:*

1. *Conduct all work in dewatered work areas*
2. *Conduct all in-water work during periods of eelgrass dormancy (November 1-March 31)*
3. *Install sediment curtains around the worksite to minimize sediment transport*
4. *Work only during periods of slack tide (minimal current) and low wind to minimize transport of sediment laden water*

Implementation of mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects of shoreline treatments on eelgrass by avoiding impacts through initial design if feasible; determining the locations of eelgrass beds through surveys; using survey data to refine shoreline treatments to further avoid or minimize impacts to eelgrass; and compensating for unavoidable impacts through the creation or restoration of eelgrass beds at a 3:1 ratio, thus replacing impacted habitat and increasing its abundance regionally. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact BI-6: Birds

Impact of Candlestick Point

Impact BI-6a **Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation) *[Criterion N.a]***

Special-status avian species (as defined in the Setting portion of this section) for which suitable habitat is present on site, and that have a "low" or better potential to occur, include the Alameda song sparrow, American peregrine falcon, burrowing owl, Bryant's savannah sparrow, California brown pelican, loggerhead shrike, northern harrier, San Francisco common yellowthroat, short-eared owl, tricolored blackbird, and white-tailed kite (refer to Table III.N-5). Some of these species have never nested on the Project site and are not expected to nest here due to the absence of suitable nesting habitat, human disturbance, or predation risk; such species include the California brown pelican, northern harrier, short-eared owl, and tricolored blackbird. Of the remaining species, only the American peregrine falcon has been confirmed breeding on the site; operational impacts to this species are discussed in Impact BI-16 below. For reasons described previously, there is a low probability that the Alameda song sparrow, burrowing owl, Bryant's savannah sparrow, loggerhead shrike, San Francisco common yellowthroat, and white-tailed kite

Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001; Appendix F – ESA and EFH Consultation.

currently breed here. Nevertheless, if any of these special-status species nests on the site, there is some potential that active nests, including eggs or young, could be destroyed by vegetation removal, grading, or other Project activities, or that Project activities could disturb nesting adults to the point of nest abandonment, causing the loss of eggs or young.

In addition to recognized special-status species, as discussed above in Regulatory Framework, all native bird species that may use the site are protected under the MBTA and *California Fish and Game Code*. These laws protect many common species in addition to those considered special-status species.

It is unlikely that construction activities would result in the loss of free-flying birds (though see Impact BI-20a for a discussion of potential bird-strike issues associated with bright lights or tall buildings). However, Project implementation and construction-related activities including, but not limited to, grading, materials laydown, facilities construction, vegetation removal, and construction vehicle traffic may result in loss of a special-status and/or legally protected avian species' active nest and/or mortality of the nest's occupants. Due to the relatively low regional populations of any special-status species that might nest on the site, the loss of active nests of a special-status bird would be significant. Although most other, non-special-status birds that may nest on the site are more common regionally, and the Project would provide a net benefit to many protected bird species, including breeding, migrant, and wintering birds, as a result of habitat enhancements, impacts to active nests of any native bird would be considered significant due to these species' protection by the MBTA and *California Fish and Game Code*.

To reduce these impacts the following mitigation measures would be implemented:

MM BI-6a.1 *Impact Avoidance and Pre-Construction Surveys for Nesting Special-Status and Legally Protected Avian Species. The following measures shall be implemented by the Project Applicant to avoid impacts to nesting birds.*

1. *Not more than 15 days prior to construction activities that occur between February 1 and August 31, surveys for nesting birds shall be conducted by a qualified biologist (one familiar with the breeding biology and nesting habits of birds that may breed in the Project vicinity) that is selected by the Project Applicant, and approved by the City/Agency. Surveys shall cover the entire area to be affected by construction and the area within a 250-foot buffer of construction or ground-disturbing activities. The results of the surveys, including survey dates, times, methods, species observed, and a map of any discovered nests, shall be submitted to the City/Agency. If no active avian nests (i.e. nests with eggs or young) are identified on or within 250 feet of the limits of the disturbance area, no further mitigation is necessary. Phased construction work shall require additional surveys if vegetation or building removal has not occurred within 15 days of the initial survey or is planned for an area that was not previously surveyed. Alternatively, to avoid impacts, the Project Applicant shall begin construction after the previous breeding season for local raptors and other special-status species has ended (after August 31) and before the next breeding season begins (before February 1).*
2. *If active nests (with eggs or young) of special-status or protected avian species are found within 250 feet of the proposed disturbance area, a minimum 250-foot no-disturbance buffer zone surrounding active raptor nests and a minimum 100-foot buffer zone surrounding nests of other special-status or protected avian species shall be established until the young have fledged. Project activities shall not occur within the buffer as long as the nest is active. The size of the buffer area may be reduced if a qualified biologist familiar with the species' nesting biology (as approved by the City/Agency) and CDFG determine it would not be likely to have adverse effects on the particular species.*

Alternatively, certain activities may occur within the aforementioned buffers, with CDFG concurrence, if a qualified biologist monitors the activity of nesting birds for signs of agitation while those activities are being performed. If the birds show signs of agitation suggesting that they could abandon the nest, activities would cease within the buffer area. No action other than avoidance shall be taken without CDFG consultation.

3. *Completion of the nesting cycle (to determine when construction near the nest can commence) shall be determined by a qualified biologist experienced in identification and biology of the specific special-status or protected species.*

MM BI-6a.2 *Burrowing Owl Protocol Surveys and Mitigation. Because burrowing owls may take refuge in burrows any time of year, species-specific measures are necessary to avoid take of this species. The following measures shall be undertaken by the Project Applicant to protect burrowing owls.*

Prior to construction activities, focused pre-construction surveys shall be conducted for burrowing owls where suitable habitat is present within the construction areas. Surveys shall be conducted by a qualified biologist (i.e., one who is familiar with burrowing owl ecology and experienced in performing surveys for them, as approved by the City/Agency) no more than 30 days prior to commencement of construction activities. These surveys shall be conducted in accordance with the burrowing owl survey protocol contained within California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines, or any more current equivalent should new guidelines be released before construction.

1. *If no occupied burrows are found in the survey area, a letter report documenting survey methods and findings shall be submitted to the City/Agency and CDFG, and no further mitigation is necessary.*
2. *If unoccupied burrows are found during the non-breeding season, prior to construction activities, the Project Applicant shall collapse the unoccupied burrows, or otherwise obstruct their entrances to prevent owls from entering and nesting in the burrows. This measure would prevent inadvertent impacts during construction activities.*
3. *If occupied burrows are found, a letter report documenting survey methods and findings (including a map showing the locations of the occupied burrows) shall be submitted to the City/Agency and CDFG. Impacts to the burrows shall be avoided by providing a construction-free buffer of 250 feet during the nesting season (February 1 through August 31). A buffer of 165 feet from the active burrows should be provided during the non-breeding season (September 1 through January 31) if feasible, though a reduced buffer is acceptable during the non-breeding season as long as construction avoids direct impacts to the burrow(s) used by the owls. The size of the buffer area may be reduced if the CDFG determines it would not be likely to have adverse effects on the owls. No Project activity shall commence within the buffer area until a qualified biologist (as approved by the City/Agency) confirms that the burrow is no longer occupied. If the burrow is occupied by a nesting pair, as recommended by the California Burrowing Owl Consortium's April 1995* Burrowing Owl Survey Protocol and Mitigation Guidelines*, a minimum of 6.5 acres of foraging habitat contiguous (immediately adjacent) to the burrow shall be maintained until the nesting season is over. If the foraging habitat contiguous to the occupied burrow is currently less than 6.5 acres, the entire foraging habitat shall be maintained until the nesting season is over.*
4. *If impacts to occupied burrows are unavoidable, passive relocation techniques approved by CDFG shall be used to evict owls from burrows within the construction area prior to construction activities. However, no occupied burrows shall be disturbed during the nesting season unless a qualified biologist (as approved by the City/Agency) verifies through non-invasive methods that juveniles from the occupied burrows are foraging independently and are capable of independent survival, or verifies the owls have not yet laid eggs. If any breeding owls must be relocated (i.e., after the nesting*

season has ended), mitigation of impacts to lost foraging and nesting habitat for relocated pairs shall follow guidelines provided in the California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines, which depending upon conditions detailed in the guidance (such as mitigation habitat quality), range from 7.5 to 19.5 acres per pair. This mitigation may take the form of the purchase of credits in a burrowing owl mitigation bank or the preservation and management of the required habitat acreage on site (e.g., in the Grasslands Ecology Park) or off site. If mitigation is provided via on-site or off-site habitat preservation and management, a Burrowing Owl Habitat Management Plan shall be prepared by a qualified biologist and submitted to the CDFG for review and approval, along with a copy to the City/Agency. This plan shall detail the location of the mitigation site, the means of preservation of the site (i.e., via a conservation easement), any enhancement and management measures necessary to ensure that habitat for burrowing owls is maintained in the long term, a monitoring program, and the size of an endowment established for the long-term maintenance of the site.

Implementation of mitigation measures MM BI-6a.1 and MM BI-6a.2 would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species by surveying for, identifying, and avoiding occupied nests and delaying construction if necessary to prevent nest abandonment, and/or providing a buffer zone around occupied nests to ensure that disturbance from construction activities do not result in the loss of individuals or destruction of nests or eggs. In addition, mitigation measure MM BI-6a.2 would require focused surveys for burrowing owls and specifies active and passive impact avoidance measures to avoid impacting this species and replace lost habitat. Specifically, if these species are identified nesting within the site, mitigation measures would implement construction buffers to protect occupied burrows, eggs, and young, as dictated by site-specific conditions in consultation with CDFG. Implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels by avoiding the loss of special-status or legally protected nesting species.

Impact of Hunters Point Shipyard Phase II

Impact BI-6b **Construction at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.a]***

Similar to development at Candlestick Point, construction-related activities including, but not limited to, grading, materials laydown, facilities construction, vegetation removal, and construction vehicle traffic may result in loss of a special-status and/or legally protected avian species' active nest and/or mortality of the nest's occupants; this would be considered a significant impact. Implementation of mitigation measures MM BI-6a.1 and MM BI-6a.2 (as detailed in Impact BI-6a), both at HPS Phase II and Yosemite Slough, would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species to less-than-significant levels.

A resident pair of American peregrine falcons has been observed successfully nesting on the Re-gunning crane on Parcel D of HPS Phase II. The Project would not remove the Re-gunning crane on Parcel D and, therefore, would not remove the nesting site. However, construction-related activities such as noise and light generating activities may disturb peregrine nesting activities. Peregrines are a state-listed endangered species (though the California Fish and Game Commission recently voted for delisting) and fully protected

under the *California Fish and Game Code*. If Project-generated disturbance is high enough, this pair of falcons could abandon the nest site entirely; due to the relatively low regional populations of this species, the loss of eggs or young due to abandonment of an active nest would be considered a substantial adverse effect and a significant impact. However, researchers at the Santa Cruz Predatory Bird Research Group[812,813] who were contacted about this Project's potential impact to this species expressed their professional opinion that like many other raptors, these peregrine falcons are expected to continue normal nesting activities if the nest site is left alone. Mitigation measure MM BI-6b would ensure effects of Project construction to nesting peregrine falcons are reduced to a less-than-significant level by identifying active nests during pre-construction surveys, delaying construction (if necessary) to limit disturbance.

MM BI-6b *American Peregrine Falcon Nest Protection Measures. To protect the nest of peregrine falcons during construction, the following measures shall be implemented by the Project Applicant prior to construction or other disturbance within 500 feet of the Re-gunning crane nest.*

1. *Not more than 30 days prior to construction activities that occur between February 1 and August 15, surveys for nesting peregrine falcons shall be conducted on the Re-gunning crane, and within a 500-foot buffer surrounding the potential nesting location. Surveys shall be performed by a qualified biologist (i.e., one familiar with falcon biology and nesting) that is selected by the Project Applicant, and approved by the City. The results of the surveys shall be submitted to the City/Agency and the CDFG. If no active peregrine falcon nests, eggs, or breeding activity, are identified on or within 500 feet of the limits of the disturbance area, no further mitigation is necessary. Alternatively, to avoid impacts, the Project Applicant can begin construction after the previous breeding season has ended (after August 31) and before the next breeding season begins (before February 1).*
2. *If active peregrine nests or breeding activity are observed within the survey area, a minimum 250-foot no disturbance buffer zone surrounding the nesting location shall be established until the young have fledged. Within this buffer, no Project construction activities shall occur while the nest is active. The size of the buffer area may be reduced if a qualified biologist and CDFG determine it would not be likely to have adverse effects on the falcons. No action other than avoidance shall be taken without CDFG consultation.*
3. *No new Project construction activity shall commence within the buffer area until young have fledged and the nest is no longer active, or until nesting has been terminated for reasons unrelated to Project activities. Completion of the nesting cycle shall be determined by a qualified biologist who is experienced in peregrine falcon breeding biology (as determined by the City/Agency).*

Implementation of mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would reduce the effects of Project construction and implementation on nesting special-status and legally protected avian species to less-than-significant levels.

812 Glenn Stewart, Coordinator, UCSC Predatory Bird Research Group. E-mail correspondence July 13, 2009.
813 The Santa Cruz Predatory Bird Research Group was founded to help restore a peregrine falcon population that had plummeted to just two known breeding pairs in California. SCPBRG conducts research to monitor and develop innovative management techniques and strategies to accelerate the recovery of peregrine falcon populations and other predatory birds.

Impact BI-7: Foraging Habitat for Raptors

Impact of Candlestick Point

Impact BI-7a **Construction at Candlestick Point would not have a substantial adverse effect on the quantity and quality of suitable foraging habitat for raptors. (Less than Significant)** ***[Criterion N.a]***

Construction on Candlestick Point would remove approximately 5.13 acres of non-native grasslands within Candlestick Point that serve as foraging habitat for grassland-associated raptors such as the red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*). Maximum counts (per survey) of eight red-tailed hawks and two American kestrels were recorded during the Yosemite Slough Watershed Wildlife surveys. Alteration of grassland habitat would also cause local reductions in habitat for prey of these raptors as well, in the areas being converted from grassland to developed uses. However, the majority of construction activities associated with Candlestick Point would not occur within grasslands and associated suitable raptor foraging habitat; rather, most of the Study Area's existing grasslands occur in areas that would not be transferred from CPSRA parkland and would, therefore, not be affected by Project activities. Therefore, adverse effects of development at Candlestick Point on raptor foraging habitat would be less than significant. No mitigation is required.

In addition, the Project's proposed ecological enhancements (as detailed in Impact BI-2), which would be refined in the Project's Draft Parks, Open Space, and Habitat Concept Plan, include measures to restore and manage areas that would be highly suitable as raptor foraging habitat. These measures would be required by MM BI-7b if this mitigation measure is adopted. The Project's enhancement of non-native grasslands that would be suitable replacement foraging habitat would, overall, be beneficial to grassland-associated raptors and more than offset any adverse effects from the removal of non-native grasslands at Candlestick Point.

Impact of Hunters Point Shipyard Phase II

Impact BI-7b **Implementation of the Project at HPS Phase II would not have a substantial adverse effect on the quantity and quality of suitable foraging habitat for raptors. (Less than Significant with Mitigation)** ***[Criterion N.a]***

Project activities associated with HPS Phase II would involve the creation of a Grasslands Ecology Park on the southern portion of HPS. Landscaping associated with creation of this park would alter approximately 43 acres of non-native grasslands within the HPS Phase II that currently serve as raptor foraging areas. As historic raptor foraging areas within the City have been reduced due to the conversion of open space to urbanized environments, permanent loss of suitable foraging habitat would be considered a substantial adverse effect.

However, the Project's proposed ecological enhancements (as detailed in Impact BI-2), which would be refined in the Project's Draft Parks, Open Space, and Habitat Concept Plan, include measures to restore and manage areas that would be highly suitable as raptor foraging habitat. Specifically, the Project's impacts to 43 acres of non-native grasslands that currently serve as raptor foraging habitat would occur as a result of enhancements that would be made to create a variety of habitats, including extensive grasslands, within the Grasslands Ecology Park. At least 43 acres of the Grasslands Ecology Park would be enhanced by

removal of invasive plants and restoration of native-dominated grasslands, and this area would be managed specifically for grassland-associated species. As a result, it would provide enhanced foraging opportunities for raptors and enhanced habitat for their prey when compared to the unmanaged, heavily disturbed non-native grasslands that currently occupy most portions of the HPS Phase II that are not already developed. Management of grasslands for grassland-associated prey species such as small mammals would benefit raptors such as American kestrels, red-tailed hawks, and barn owls that frequently forage in grasslands. Throughout the Project site, including parks and open space areas on both Candlestick Point and HPS Phase II, approximately 10,000 net new trees (more than four times the number currently present in the Project area) would be planted at the Project site and in the community. Many of these trees would be suitable for raptor perching, some of which would provide raptor nest sites as they mature. As discussed previously, the Project's planting of trees and shrubs would increase the abundance of smaller birds on the site, and increases in the general abundance of migratory birds as a result of shrub and tree planting would increase prey for raptors such as Cooper's hawks, sharp-shinned hawks, and merlins that specialize on birds, thus enhancing the quality of foraging habitat for these raptors. Because habitat use by red-shouldered hawks (*Buteo lineatus*) can be limited by perch availability in vast open areas, the introduction of perches by planting of trees near grasslands is expected to enhance foraging habitat conditions on large open areas such as southern HPS Phase II, as has been documented in southern California.[814]

The Project's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b shall be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur.

MM BI-7b *Enhancement of Raptor Foraging Habitat. The Draft Parks, Open Space, and Habitat Concept Plan shall implement, at a minimum, the following measures in open space areas outside the CPSRA, and if allowed, within the CPSRA area:*

- ***Restoration and Management of Grasslands:*** *To maintain grassland-associated wildlife species on the site, grasslands extensive enough to support such species shall be maintained and enhanced through the restoration of native grasses. Such grassland habitat shall not be well manicured or regularly mown. No trees shall be planted within such areas, and shrub cover would be limited to a few small, scattered patches of low-statured coastal scrub plants. At a minimum, replacement of non-native grassland impacted at HPS Phase II with native-dominated grassland shall occur at a ratio of 1:1 (1 acre of native-dominated grassland restored: 1 acre of non-native grassland impacted).*
- ***Increase in Tree/Shrub Cover:*** *Trees and shrubs (particularly natives) shall be planted and maintained outside the designated grassland restoration area to provide foraging habitat for raptors and other migratory birds, and cover for mammals, reptiles, and smaller birds that may serve as raptor prey. While native vegetation shall be favored, site-appropriate non-native trees and shrubs that provide food or structural resources that are particularly valuable to native wildlife shall also be considered. Approximately 10,000 net new trees shall be planted at the Project site and in the community, in addition to trees that will be replaced as required by the Urban Forestry Ordinance or MM BI-14a.*

[814]Bloom, P. H. and M. D. McCrary. 1996. The urban Buteo: red-shouldered hawks in southern California. Pages 31-39 in D. Bird, D. Varland, and J. Negro (eds.), Raptors in Human Landscapes. Academic Press.

The elements identified above shall be reviewed and approved by a qualified biologist (one familiar with the ecology of the Project site), and the Draft Parks, Open Space, and Habitat Concept Plan shall be implemented during construction of the Project. This plan shall be approved by the Agency prior to construction, and its preparation and implementation shall be the financial responsibility of the Project Applicant.

The Project's ecological enhancements (as detailed in the Draft Parks, Open Space, and Habitat Concept Plan), the requirements specified in mitigation measure MM BI-7b, and new and improved parkland, would provide both raptor foraging opportunities and enhanced raptor and raptor prey habitat. Consequently, adverse effects to raptor foraging habitat would be less than significant. Further, these Project improvements would result in a net increase in the quality of suitable raptor foraging habitat, as well as providing ancillary habitat improvement benefits to their prey species (small mammals, birds, and insects) that could result in a higher prey base for raptors within HPS Phase II. Overall, with mitigation, the effect of the Project on raptors is expected to be beneficial.

Impact BI-8: Terrestrial Mammals: Western Red Bat

Impact of Candlestick Point

Impact BI-8a **Construction at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on the western red bat, a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant)** ***[Criterion N.a]***

The only special-status bat species with the potential to occur within the Study Area is the western red bat. Potential roosting habitat for this species is present within the Project site in the mature trees where bats would roost in the foliage during migration and during the winter months (August–April). Construction activities that would remove these potential roosting sites could result in a small number of individuals being displaced, injured, or killed. However, several factors need to be taken into account when assessing the potential significance of the displacement or potential loss of a limited number of these individuals:[815]

1. This species is not a communal rooster, and any one tree would not be expected to contain large numbers of this species. Thus, any impacts to individuals would be very limited on a per-tree basis.
2. This species is highly affiliated with riparian communities that are dominated by mature trees with stands that are greater than 50 meters wide (i.e., red bat populations require fairly extensive stands of riparian forest). Consequently, the habitat on site is not of high quality for roosting or foraging and not essential to the species' survival or reproduction. As a result, few individuals are likely to be present on the site at any one time, and the number of individuals that could be directly impacted by the Project would be very low.
3. This species is not known to breed along the coast and is thought to migrate out of coastal regions to breed. Thus, the habitat on site would not be used for breeding and young would not be impacted.
4. Individuals roost in the canopy, generally well above any work areas and are averse to human disturbances and noise. Thus, if individuals were present they would not be directly impacted by tree

[815] Pierson, E.D., W.E. Rainey and C. Corben. 2006. Distribution and status of western red bats (*Lasiurus blossevillii*) in California. Calif. Dept. Fish and Game, Habitat Conservation Planning Branch, Species Conservation and Recovery Program Report 2006-04, Sacramento, CA 45 pp.

removal machinery as they are highly sensitive to noise and disturbance and would likely disperse to other areas while the trees are being removed.

5. The Central Valley of California, particularly the Sacramento and San Joaquin drainages and the lower reaches of the large rivers that drain the Sierra Nevada (i.e., Tuolumne, Merced, and likely the American and Cosumnes), take on disproportional importance for the future viability of this species. Thus, from an ecological sense, the Project would not impact critical range of this species or individuals occupying those areas.

Consequently, while removal of large trees could lead to disturbance and mortality of a very limited number of this species, the loss or disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. Impacts would be less than significant, and no mitigation is required.

In addition, the Project's Draft Parks, Open Space, and Habitat Concept Plan identifies ecological enhancement measures, including the planting of approximately 10,000 net new trees at the Project site and in the community, many of which would be suitable roosting habitat for this species, and result in an increase in potential roosting sites. These measures would be required by MM BI-7b. In addition, mitigation measure MM BI-14a requires the replacement of removed trees at a 1:1 ratio. With implementation of MM BI-7b and MM BI-14a, the effect of construction activities at Candlestick Point on the western red bat would be expected to be beneficial.

Impact of Hunters Point Shipyard Phase II

Impact BI-8b **Construction at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on the western red bat, a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant)** ***[Criterion N.a]***

Similar to development at Candlestick Point, potential roosting habitat for this species is present within the Project site in the mature trees where bats would roost in the foliage during migration and the winter months (August—April). Construction activities that would remove these potential roosting sites could result in a small number of individual being displaced, injured, or killed. However, as detailed in Impact BI-8a, while removal of large trees could lead to disturbance and mortality of a very limited number of this species, the loss or disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. Impacts would be less than significant, and no mitigation is required. Further, as discussed in Impact BI-8a, with implementation of MM BI-7b and MM BI-14a, the effect of construction activities on the western red bat would be expected to be beneficial.

Impact BI-9: Marine Mammals and Fish

Impact of Candlestick Point

Impact BI-9a **Pile driving associated with construction at Candlestick Point would not have a substantial adverse effect either directly or through habitat modifications, on marine mammals or fish identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact)** ***[Criterion N.a]***

Development in Candlestick Point has no in-water components that require pile driving and, therefore, would have no substantial adverse effects to sensitive fish or marine mammals as a result of pile driving. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-9b **Pile driving associated with construction of the marina and the Yosemite Slough bridge would not have a substantial adverse effect at HPS Phase II, either directly or through habitat modifications, on marine mammals or fish identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.a]***

It is possible that any of the sensitive fish species listed in the Setting section could be found within aquatic habitats of HPS Phase II during certain times of year. Those include green sturgeon, Chinook salmon, steelhead, and longfin smelt. Marine mammals such as the harbor seal and California sea lion could also be present. Pacific herring and a number of other non-special-status fish could also occur in these waters. The high noise levels generated by pile driving have the potential to disturb, injure, or kill these species.

Construction of the marina would require the use of a pile driver to install the new pilings required to anchor the floats. New piles may also need to be driven to support and stabilize existing wharves if future investigations identify weaknesses in existing support structures. When piles are struck by a hammer, they generate ground vibrations and sound. When this occurs in the air, we hear the result. When this occurs in water, the effect is transmitted as a pressure wave. The magnitude of this wave is dependent on the type of pile being installed (solid, hollow, concrete, wood, steel) and the hammer being used (impact or vibratory). The combination that generates the strongest wave is a hollow steel pile struck with an impact hammer.

The in-water pressure wave, if of sufficient magnitude, can injure or kill fish. Pressure waves have an actual force associated with them and the stronger the force, the more likely they are to damage sensitive tissues in fish. Pressure waves interact with fish in the water column generating effects from behavioral such as avoidance, to physiological such as stress, temporary loss of hearing, rupture of swim bladders (air pockets that are used for buoyancy), formation of bubbles in the circulatory system and corresponding rupturing of blood vessels, traumatic brain injuries, to death.[816] Species with swim bladders are the most susceptible although ear structures of any species can be damaged. Current NMFS guidelines indicate that 180 decibels generating 1 micropascal

[816] Hasting, M.C. and A.N. Popper. Effects of sound on fish. Prepared for California Department of Transportation, January 28, 2005.

can injure or kill fish.[817,818] Marine mammals, which have sensitive hearing, can easily be disturbed by sound-generated pressure waves although it would be unlikely to cause injury or mortality.

Construction of the marina could require the installation of about 675 new pilings.[819] The conceptual design of the marina does not specify pile installation methods, type of pile, or the season during which installation could occur. Based on experience with other marina improvements in San Francisco Bay, steel piles are likely required for at least some structural elements of the marina. As was discussed above, installation of these piles with an impact hammer has the potential to generate substantial sound pressure waves. Installation of pilings that resulted in generation of sound pressure waves above the threshold indicated could result in the mortality of any of the sensitive species of fish listed above. Additionally, the noise would disrupt normal behavior patterns of marine mammals, which would be a violation of the *Marine Mammal Protection Act*. Either of these effects would be considered a potentially significant impact.

The current design for the Yosemite Slough bridge would have 20 columns supported by steel piles. However, current Yosemite Slough bridge designs would require installation of coffer dams (temporary structures typically constructed with sheet-pilings[820] that separate a worksite from the water and allow it to be dewatered). The bridge piles would be driven behind dewatered coffer dams. Because piles would be driven behind the coffer dam and, therefore, out of the water, pile installation would not result in generation of in-water sound pressure waves that could injure fish species, and ground pressure waves produced by pile driving within a dewatered coffer dam are not expected to injure fish.

To reduce these impacts the following mitigation measures would be implemented:

MM BI-9b *Pile Driving Design and Minimization Measures. To minimize impacts on fish and marine mammals, the Project Applicant shall implement the following measure to reduce the amount of pressure waves generated by pile driving. The first set of measures shall be implemented during Project design. The second set of measures shall be implemented during construction.*

Design Measures:

1. *Engineer structures to use fewer or smaller piles, where feasible, and preferably, solid piles.*
2. *Design structures that can be installed in a short period of time (i.e., during periods of slack tide when fish movements are lower).*
3. *Do not use unsheathed creosote-soaked wood pilings.*

The City/Agency, with consultation from a qualified biologist who is familiar with marine biology, as approved by the City/Agency, shall review the final Project design to ensure that these design requirements have been incorporated into the Project.

Construction Measures:

1. *Drive piles with a vibratory device instead of an impact hammer if feasible.*

[817] A micropascal is a measure of pressure per unit area where 1 micropascal equals 0.0000145 pounds per square inch.
[818] NMFS. San Francisco Bay Project Impact Evaluation System. Website: http://mapping2.orr.noaa.gov/website/portal/pies/piledriving.html. Accessed February 16, 2009.
[819] Devick, C. Moffat & Nichol. E-mail to C. Mason and D. Ebert, January 15, 2009 with fill volumes for the Marina.
[820] Sheet piles are flat metal "boards" that are driven into the substrate with a pile driver. They interlock with each other to form a vertical water tight wall.

2. *Restrict driving of steel piles to the June 1 to November 30 work window, or as otherwise recommended by NMFS (driving of concrete piles would not be subject to this condition).*
3. *Avoid installation of any piles during the Pacific herring spawning season of December through February. Consult with the CDFG regarding actual spawning times if pile installation occurs between October and April.*
4. *If steel piles must be driven with an impact hammer, an air curtain shall be installed to disrupt sound wave propagation, or the area around the piles being driven shall be dewatered using a cofferdam. The goal of either measure is to disrupt the sound wave as it moves from water into air.*
5. *If an air curtain is used, a qualified biologist shall monitor pile driving to ensure that the air curtain is functioning properly and Project-generated sound waves do not exceed the threshold of 180-decibels generating 1 micropascal (as established by NMFS guidelines). This shall require monitoring of in-water sound waves during pile driving.*
6. *Unless the area around the piles is dewatered during pile driving, a qualified biologist shall be present during driving of steel piles to monitor the work area for marine mammals. Driving of steel piles shall cease if a marine mammal approaches within 250 feet of the work area or until the animal leaves the work area of its own accord.*

Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities by recommending the type of piles to use to minimize sound impacts, provide for an alternative method of installation to minimize sound impacts, requiring installation during an agency-approved construction window when fish are least likely to be present and thus avoid the bulk of potential impacts, and require a construction monitor to ensure all measures, including sound monitoring are complied with. This measure would not be required for the Yosemite Slough bridge if piles were driven in dry conditions behind coffer dams, as is proposed, no aquatic pressure waves would be generated. Implementation of this mitigation measure would reduce potential adverse effects to less-than-significant levels.

Impact BI-10: Mollusks

Impact of Candlestick Point

Impact BI-10a **Construction at Candlestick Point would require the removal of hard substrates (riprap) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant)** ***[Criterion N.a]***

Development at Candlestick Point would require limited in-water work. This work would be associated with the shoreline treatments; specifically, the placement of additional (rock) rip-rap, ACB mats, and/or marsh soils to improve the existing riprap shoreline edge for the purpose of reducing shoreline erosion and flooding and improving shoreline habitat. Shoreline treatments would require the removal of some substrate in areas where the Bay is eroding the existing shoreline. In these areas, hard substrates suitable for oyster settlement (rock, riprap, sheet pile, etc) would be removed, potentially directly impacting native oysters. However, in many areas, the same shoreline treatments would entail replacement of this substrate with a similar material that would also be suitable for oyster settlement. These shoreline improvements would temporarily affect substrate used by native oysters; however, habitat for substrate would be replaced with equal amounts of equivalent habitat after the treatments are complete. This would not substantially

reduce populations or available habitat. Consequently, Candlestick Point would not have a substantial adverse effect on native oysters. Impacts would be less than significant, and no mitigation is required.

In other areas, particularly along the northern edge of the Candlestick Point shoreline, the placement of ACB mats and/or marsh soils to enhance marsh development could result in the replacement of hardened substrate that may currently provide settlement habitat for oysters with softer marsh substrate that would not support oysters. No large concentrations of oysters are known to occur along the Candlestick Point shoreline, and thus marsh restoration is not expected to result in substantial declines in oyster abundance. Restoration of salt marsh along the Candlestick Point shoreline would increase the input of organic material in the area to some extent, and improvement of the shoreline would reduce erosion, which currently produces turbidity that is likely detrimental to native oysters. Thus, these shoreline improvements would confer some benefits to oysters.

Impact of Hunters Point Shipyard Phase II

Impact BI-10b **Construction at HPS Phase II would require removal of hard substrates (docks, riprap, seawalls, pilings, etc) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant)** ***[Criterion N.a]***

Native oysters are typically found on hard substrates (rock, pilings, breakwaters, etc.) in shallow intertidal and subtidal habitats along the shoreline of the Bay. Any actions that would require the modification of existing hard substrates would have the potential to impact native oysters. Implementation of the Project would also remove small sections of Piers 1, 2, and 3 to separate them from the shore and prevent public access (refer to Figure II-4 [Proposed Land Use Plan]). Those piers provide pilings that are considered a suitable substrate for oyster settlement and thus could be supporting native oysters[821]. The removal of this small section of the piers would, therefore, result in the loss of a very small amount of oyster habitat and potentially of individual oysters. In addition, the Project also includes plans to repair portions of existing seawall structures, place buttress fill (below the water surface) for structural stability of seawall structures, and modify several piers and drydocks along the shoreline of HPS Phase II. These shoreline improvements could affect native oysters and their habitat. As discussed for Candlestick Point above, the end result of shoreline improvements in some areas would be hard substrate similar to what is currently present, and thus equally suitable for oyster colonization. In other areas, the placement of ACB mats and/or marsh soils to enhance marsh development could result in the replacement of hardened substrate that may currently provide settlement habitat for oysters with softer marsh substrate that would not support oysters. These shoreline improvements would temporarily affect substrate used by native oysters, but would not substantially reduce populations or available habitat. Consequently, construction activities at HPS Phase II would not have a substantial adverse effect on native oysters.

In addition, the Project proposes to create a new marina, which would require installation of two breakwater sections (ranging between 300 and 650 feet in length)[822] that would provide suitable settlement habitat for

[821] Couch, D., and T.J. Hassler. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest)—Olympia oyster. US Fish and Wildlife Service Biol. Rep. 82(11.124). US Army Corps of Engineers, TR EL-82-4. 8 pp.
[822] Devick, Christopher, Moffat-Nichol email to Therese Brekke of Lennar Urban and Terri Vitar of PBS&J regarding length of marina breakwater, dated July 23, 2009.

native oysters. Consequently, HPS Phase II construction would result in a series of offsetting impacts; temporary impacts associated with the removal of suitable oyster habitat, followed by the replacement of these areas with new suitable habitat. The new breakwaters would be considered suitable habitat for oyster settlement equating to about 0.10 acre of new habitat. In addition, the construction of approximately 5,700 feet of a floating dock system and 80 feet of gangways that would also provide new suitable habitat for oyster settlement. Therefore, although temporary impacts to oyster habitat would occur during construction, HPS Phase II effects on native oysters would be less than significant and no mitigation is required.

Impact of Yosemite Slough Bridge

Impact BI-10c **Construction of the Yosemite Slough bridge may require removal of hard substrates (docks, riprap, seawalls, pilings, etc) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. (Less than Significant)** ***[Criterion N.a]***

Construction of the Yosemite Slough bridge may result in the removal of or modifications to a small amount of riprap where the bridge abutments would be located. Riprap below the MHW elevation may be used by native oysters. However, riprap would also be placed near the abutments once they are constructed, thus replacing any oyster substrate that is temporarily impacted or removed. Furthermore, the bridge piers would provide a hard substrate that could potentially serve as substrate for oyster colonization. Thus, the construction of the Yosemite Slough bridge would not result in the permanent loss of oyster habitat, and could instead result in a net gain in potential substrate for oysters at that location. Therefore, although temporary impacts to oyster habitat would occur during construction, the Yosemite Slough bridge would not have a substantial adverse effect on native oysters. Impacts would be less than significant, and no mitigation is required.

Impact BI-11: Special-status Fish

Impact of Candlestick Point

Impact BI-11a **Construction at Candlestick Point would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead, and would not result in impacts to individuals of these species as well as Chinook salmon and longfin smelt through disturbance and loss of aquatic and mudflat habitat as a result of construction of shoreline revetments. (Less than Significant with Mitigation)** ***[Criteria N.a and N.d]***

Development at Candlestick Point would require minor in-water work associated with the shoreline treatments. Work in these areas would require the repair of existing shoreline protection measures. All work would occur in relatively shallow water areas that are unlikely to support foraging special-status fish.[823] Still, the NMFS has considered the entire Bay in the site vicinity to be designated critical habitat for the green sturgeon and Central California Coast steelhead, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by shoreline construction activities.

[823] Proposed Designation of Critical Habitat for the Southern Distinct Population Segment of North American Green Sturgeon, Draft Biological Report, National Marine Fisheries Service, September 2008.

Construction of shoreline protection measures would primarily entail the reconstruction of the existing shoreline. The new shoreline treatments would be designed to reduce erosion of the shoreline, and thus existing turbidity impacts from coastal erosion would be reduced by the Project. Some additional fill would be placed below the MHW elevation to reduce the slope of the shoreline, thus providing more beach and marsh habitat, following construction of the revetments. As a result, there would be a net decrease of approximately 0.42 acre of open waters along the shoreline of Candlestick Point. In addition, temporary impacts to aquatic habitat of these species, including designated critical habitat for the green sturgeon and Central California Coast steelhead, would occur as a result of increased turbidity and movement of materials within aquatic habitat along the shoreline during construction. Because of the regional rarity of these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

Implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2 (described above) would reduce the effects of construction-related activities to aquatic habitat by mitigating for the temporary and permanent loss of jurisdictional waters from the Project as a whole by requiring compensatory mitigation (i.e., creation and/or restoration), obtaining permits from the USACE, SFRWQCB, BCDC, and other agencies as applicable that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including aquatic habitats.

- Implementation of mitigation measure MM BI-12a.1 and MM BI-12a.2 would reduce effects of construction activities on special-status fish by avoiding in-water construction during periods when sensitive species are most likely to be present in waters of the Project site and by educating construction personnel regarding measures to be implemented to protect fish and their habitats. Implementation of these mitigation measures would minimize any adverse effects on aquatic habitat of special-status fish, including designated critical habitat for the green sturgeon and Central California Coast steelhead, during construction and compensate for any residual impacts to these species' habitats resulting from the Project as a whole, thus reducing impacts to special-status fish to less-than-significant levels.

Impact of Hunters Point Shipyard Phase II

Impact BI-11b **Construction at HPS Phase II would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead, and would not result in impacts to individuals of these species as well as Chinook salmon and longfin smelt through temporary and permanent disturbance of aquatic and mudflat habitat during construction of shoreline revetments. (Less than Significant with Mitigation)** ***[Criteria N.a and N.d]***

Construction activities at HPS Phase II include elements that would impact designated critical habitat for green sturgeon and Central California Coast steelhead within the Bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by these activities as well. Construction of the proposed marina (including breakwaters) in what is now open water would result in the loss of habitat for these special-status fish species. Construction of shoreline treatments and placement of fill in other locations around the perimeter of HPS would also affect a small amount of shallow, relatively low-quality foraging habitat for green sturgeon and steelhead, as discussed for Candlestick Point in Impact BI-11a above. Consequently, these elements of the Project would impact existing critical habitat for green sturgeon and Central California Coast steelhead.

Because of the regional rarity of all these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

Some Project features would reduce the Project's impacts to these special-status fish species and designated critical habitat. Some areas of shoreline that are currently sheet-pile walls would be modified, and portions of several piers would be removed to provide new aquatic habitat that could be used by these fish. A net increase of approximately 8 acres of new aquatic habitat would result. Furthermore, the new shoreline treatments would be designed to reduce erosion of the shoreline, and, thus, existing turbidity impacts from coastal erosion would be reduced by the Project.

Compensatory mitigation for impacts to aquatic habitat, which include habitat used by green sturgeon, Central California Coast steelhead, Chinook salmon, and longfin smelt, would be provided as described by mitigation measure MM BI-4a.1, and mitigation measure MM BI-4a.2 shall be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of mitigation measure MM BI-12a.1 and MM BI-12a.2 would reduce effects of construction activities on special-status fish by avoiding in-water construction during periods when sensitive species are most likely to be present in waters of the Project site and by educating construction personnel regarding measures to be implemented to protect fish and their habitats. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels.

Impact of Yosemite Slough Bridge

Impact BI-11c **Construction of the Yosemite Slough bridge would not have a substantial adverse effect on designated critical habitat for green sturgeon and Central California Coast steelhead and would not result in impacts to individuals of these species, Chinook salmon, or longfin smelt through disturbance or loss of aquatic and mudflat habitat as a result of construction of shoreline revetments. (Less than Significant with Mitigation)** ***[Criteria N.a and N.d]***

Construction of the Yosemite Slough bridge would impact designated critical habitat for green sturgeon and Central California Coast steelhead through the construction of pilings required to support the bridge. Bridge impact areas are relatively shallow intertidal mud flats that are likely not suitable foraging habitat for either species. Those areas are likely too shallow to meet the depth or food PCEs for sturgeon and should not be considered critical habitat. Specifically, NMFS's own studies show that for juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 1 to 3 meters (approximately 3.3 to 10 feet deep), indicating juveniles likely prefer depths deeper than those within the majority of the proposed bridge construction footprint for rearing and foraging.[824] Nevertheless, it is possible that green sturgeon and Central California Coast steelhead, and possibly other special-status fish such as Chinook salmon and longfin smelt, could forage in the vicinity of the proposed bridge during high tides. Therefore, construction of the bridge could impact these species due to temporarily increased turbidity and modification of mudflat habitat during construction and permanent loss of 0.11 acre of mudflat and aquatic habitat in the footprints of the bridge piers. In addition, shading from the bridge could adversely affect aquatic and mud flat habitat, and fish that use these habitats, under the bridge (refer to

[824] Proposed Designation of Critical Habitat for the Southern Distinct Population Segment of North American Green Sturgeon, Draft Biological Report, National Marine Fisheries Service, September 2008.

Impact BI-4c). Because of the regional rarity of all these special-status fish, any impacts to individuals or to habitat used by these fish would be significant.

As described under Impact BI-11b above, some Project components would benefit these fish by increasing the extent of open water in the Project area through removal of existing structures and by reducing coastal erosion. In addition, compensatory mitigation for impacts of the bridge to aquatic habitat would be provided as described by mitigation measure MM BI-4a.1 and MM BI-4c, and mitigation measure MM BI-4a.2 shall be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of mitigation measure MM BI-12a.1 and MM BI-12a.2 would reduce effects of construction activities on special-status fish by avoiding in-water construction during periods when sensitive species are most likely to be present in waters of the Project site and by educating construction personnel regarding measures to be implemented to protect fish and their habitats. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels.

Impact BI-12: Essential Fish Habitat

Impact of Candlestick Point

Impact BI-12a **Construction at Candlestick Point would not have a substantial adverse effect on designated essential fish habitat through (EFH) or result in a substantial change in total available essential fish habitat through placement of riprap and other fill or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.b]***

The Bay adjacent to the Project site has been designated EFH in the Pacific Coast Salmon Plan,[825] Coast Pelagics Fishery Management Plan,[826] and Pacific Groundfish Fishery Management Plan.[827] These management plans include species such as northern anchovy (*Engraulis moradax*), Pacific herring, Pacific sardine, Chinook salmon, and a dozen species of groundfish [i.e., starry flounder (*Platichthys stellatus*), English and sand sole (*Parophrys vetulus* and *Psettichthys melanostictus* respectively), leopard shark (*Triakis semifasciata*), lingcod (*Ophidon elongates*), cabezone (*Scorpaenichthys marmoratus*), and various rockfish]. The only in-water portions of Candlestick Point are associated with shoreline treatments. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered to result in changes to designated EFH. Installation of shoreline treatments would modify EFH due to modification of mudflat habitat and increased turbidity during construction. As shown in Table III.N-4, approximately 4.98 acres of aquatic habitat that would be considered EFH will be impacted by the project. The majority of these impacts would be temporary, as they would occur during replacement of the existing revetment

[825] PFMC (Pacific Fisheries Management Council) 2003. Pacific Coast Salmon plan: Fishery management plan for commercial and recreational fisheries off the coasts of Washington, Oregon, and California as revised through amendment 14.
[826] PFMC (Pacific Fisheries Management Council) 1998. The coastal pelagic species fishery management plan. As amended through 2006.
[827] PFMC (Pacific Fisheries Management Council) 2008. Pacific coast groundfish fishery management plan for the California, Oregon, and Washington groundfish fishery as amended through amendment 19.

with similar structures. However, as described in Impact BI-11a above, these activities would result in a net decrease of approximately 0.42 acre of open waters along the shoreline of Candlestick Point. Although the EFH that would be temporarily impacted by construction at Candlestick Point represents a minute fraction of available EFH in the Bay, this impact would be substantial, in the absence of mitigation, due to the importance of EFH to the ecology of the Bay.

Impact BI-2 above described the less-than-significant impact of the Project to common fish, shellfish, and mollusks. Although impacts to the populations of common aquatic species would be less than significant, as described in Impact BI-2, construction at Candlestick Point would be considered to have a substantial adverse effect on EFH overall because the function of that habitat would be altered by the Project, potentially having longer-term consequences on aquatic habitat for both common and special-status aquatic species. Any loss of EFH that would result from construction activities at Candlestick Point would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1), and measures to avoid and minimize adverse effects to aquatic habitats, described in mitigation measure MM BI-4a.2, would further reduce potential adverse effects to EFH. To reduce this potential impact to less-than-significant levels, the following mitigation measures would also be implemented.

MM BI-12a.1 *Seasonal Restrictions on In-Water Work. In-water work when juvenile salmonids are moving through the estuary on the way to the ocean or when groundfish and prey species could be directly impacted shall be avoided. Because steelhead are potentially present, the allowed dredge window for this area of the San Francisco Bay is June 1 through November 30.*[828] *All in-water construction shall occur during this window. If completion of in-water work within this period is not feasible due to scheduling issues, new timing guidelines that shall be established and submitted to NMFS and CDFG for review and approval.*

MM BI-12a.2 *Worker Training. Personnel involved in in-water construction and deconstruction activities shall be trained by a qualified biologist (experienced in construction monitoring, as approved by the City/Agency) in the importance of the marine environment to special-status fish, birds, and marine mammals and the environmental protection measures put in place to prevent impacts to these species, their habitats, and Essential Fish Habitat. The training shall include, at a minimum, the following:*

- *A review of the special-status fish, birds, and marine mammals and sensitive habitats that could be found in work areas*
- *Measures to avoid and minimize adverse effects to special-status fish, birds, marine mammals, their habitats, and Essential Fish Habitat*
- *A review of all conditions and requirements of environmental permits, reports, and plans (i.e., USACE permits)*

Mitigation measure MM BI-12a.1 would reduce the effects of construction-related activities to EFH by establishing a construction window that would minimize impacts to fish by avoiding migration and breeding periods, and mitigation measure MM BI-12a.2 would ensure that personnel involved in construction and deconstruction activities are trained on measures to avoid and minimize adverse effects to special-status aquatic species and their habitats. Implementation of these mitigation measures, along with mitigation measures MM BI-4a.1 and MM BI-4a.2, would reduce potential adverse effects on EFH at Candlestick Point to less-than-significant levels.

[828] LTMS Environmental Work Windows Work Group. LTMS Informal work windows, Informal consultation preparation packet. Draft version 1.4. February 2004. Website: http://www.spn.usace.army.mil/conops/informal.pdf.

Impact of Hunters Point Shipyard Phase II

Impact BI-12b **Construction at HPS Phase II would not have a substantial adverse effect on designated essential fish habitat through (EFH) through placement of riprap and other fill, or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.b]***

The same three fishery management plans and the species covered in those plans discussed in the previous impact statement apply to HPS Phase II. The modifications to EFH that could arise from HPS Phase II are associated with the proposed marina, placement of rock fill to buttress existing bulkheads, and the shoreline treatments. Marina operations could affect EFH through potential impacts to water quality and fish habitat resulting primarily from spills or intentional discharges of fuel or other harmful substances from boats using, or fueling facilities associated with, the marina. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat, and the Project would thus substantially modify EFH within the waters adjacent to the HPS Phase II site.

Overall, activities at HPS Phase II will affect 21.11 acres of aquatic habitat that would be considered EFH. However, in addition to activities resulting in fill of EFH, the Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization and restoration purposes, removal of structures and fill would restore approximately 8 acres of new aquatic habitat, more than offsetting the loss of EFH resulting from placement of fill for buttresses.

Other elements of HPS Phase II construction that could affect EFH are the shoreline treatments. Repairs to the seawall and other shoreline treatments proposed for HPS Phase II would result in modifications to EFH, both due to modification of substrate and mobilization of sediments during construction, but because these impacts are primarily temporary, are localized and often replace an existing failing structure with a similar structure, these repairs would not result in a substantial modification of the function of existing EFH. Also, shoreline improvements along the southern edges of HPS would reduce coastal erosion and associated turbidity, resulting in a long-term benefit to water quality and EFH. Collectively, these repairs and improvements of the Project are not considered to result in a substantial reduction in designated EFH.

Impact BI-2 above described the less-than-significant impact of the Project to common fish, shellfish, and mollusks. Although impacts to the populations of common aquatic species would be less than significant, as described in Impact BI-2, the HPS Phase II development would be considered to have a substantial adverse effect on EFH overall because the function of that habitat would be altered by the Project, potentially having longer-term consequences on aquatic habitat for both common and special-status aquatic species. Any loss of EFH that would result from construction activities at HPS Phase II would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure

MM BI-4a.1) and, if necessary, mitigation for impacts to eelgrass (mitigation measure MM BI-5b.3). Measures to avoid and minimize adverse effects to aquatic habitats and eelgrass beds, described in mitigation measures MM BI-4a.2 and MM BI-5b.1 through MM BI-5b.4, would further reduce potential adverse effects to EFH. The measures described above to mitigate impacts to EFH at Candlestick Point (MM BI-12a.1 and MM BI-12a.2) will be implemented at HPS Phase II as well. Because activities at HPS Phase II involve more in-water work than at Candlestick Point, and involve the demolition of existing structures in and immediately adjacent to EFH, the following additional mitigation measures will also be implemented at HPS Phase II to reduce potential impacts to less-than-significant levels.

MM BI-12b.1 *Essential Fish Habitat Avoidance and Minimization Measures. The following mitigation measures have been adapted from Amendment 11 of the West Coast Groundfish Plan[829] and Appendix A of the Pacific Coast Salmon Plan.[830] Incorporation of the following, or equivalent mitigation as otherwise required by the USACE or NMFS, would reduce the impacts to Essential Fish Habitat (EFH) to a level considered less than significant. Unless modified by the federal permitting agencies (NMFS or USACE), these measures shall be implemented during construction by the Project Applicant. Any reporting required shall be specified in the USACE permits and reports shall be submitted to the USACE and NMFS.*

- *If dredging is required, permits will be obtained through the Dredged Material Management Office (DMMO) process, and the following mitigation from the Long-Term Management Strategy (LTMS) shall be implemented:*
  - > *Dredging shall avoid areas with submerged aquatic vegetation (eelgrass beds or other EFH areas of particular concern) especially where the action could affect groundfish, prey of outmigrating juvenile salmon or groundfish, larval marine species, or habitat for native oysters*
  - > *Sediments shall be tested for contaminants as per EPA and USACE requirements. Contaminated sediments shall be disposed of in accordance with EPA and USACE guidelines*
  - > *Slopes of the dredged area shall be gradual enough so that sloughing is unlikely to occur. Verification of these conditions shall be achieved through follow-up bathymetric surveys*
  - > *To minimize turbidity and potential resuspension of contaminated sediments, dredging shall use suction equipment, or similar equipment, when feasible. Where an equipment type may generate significant turbidity (i.e., clamshell), dredging shall be conducted using adequate engineering and best management practices to control turbidity. These include, but are not limited to, sediment curtains and tidal work windows.*
- *All construction equipment used in conjunction with in-water work (pipelines, barges, cranes, etc.) shall avoid wetlands, marshes, and areas of subaquatic vegetation (including eelgrass beds)*
- *Upland disposal options shall be considered for all spoils generated by on-site construction, especially if high levels of contaminants are present*
- *Maximize the use of clean dredged material for beneficial use opportunities, such as salt marsh restoration*
- *Use Best Management Practices (BMPs) for controlling pollution from marina operations, boatyards, and fueling facilities that meet, as applicable, the BMPs listed in the National*

[829] PFMC 1998. Essential Fish Habitat – West Coast Groundfish, Amendment 11.
[830] PFMC 1999. Appendix A: Identification and description of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon. *In* Pacific Coast Salmon Plan (1997) as amended through Amendment 14. Website: http://www.pcouncil.org/salmon/salfmp/a14.html.

Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating[831]

MM BI-12b.2 *Deconstruction/Construction Debris Recovery. A Seafloor Debris Minimization and Removal Plan shall be prepared by the Project Applicant and approved by the City/Agency, prior to initiation of in-water deconstruction (dismantling) or construction activities. The Plan shall be implemented during in-water deconstruction or construction activities, and such activities shall be monitored by a qualified biologist who is experienced in construction monitoring (as approved by the City/Agency). The Seafloor Debris Minimization and Removal Plan shall include, at a minimum:*

- *Debris field boundaries associated with deconstruction activities*
- *Identification of measures taken to minimize the potential for debris to fall into aquatic habitats (i.e., the use of netting below in-water construction or deconstruction areas)*
- *Deconstruction equipment, tools, pipes, pilings, and other materials or debris that are inadvertently dropped into the Bay, along with their descriptions and locations*
- *Circumstances requiring immediate cessation of deconstruction activities and immediate initiation of search and recovery efforts, including procedures for implementing those recovery efforts*
- *How lost debris that is to be removed post-deconstruction is to be identified, who will be conducting search and recovery operations, and the survey methods to be employed to locate lost equipment and materials*
- *Criteria that will be used to:*
  - *Determine whether recovery efforts are appropriate for the object being recovered and do not result in potential environmental impairment greater than if the debris was allowed to remain in place*
  - *When sufficient effort has been expended to recover a lost object(s) with no success and continued efforts to recover the seafloor debris have diminishing potential for success and/or result in environmental impairment greater than leaving the debris in place*
- *Person(s) responsible for implementing the Plan and making the determination on the type of recovery required*
- *How debris is to be disposed of or recycled*
- *Metrics for determining when recovery efforts will be considered complete*

Following completion of all post deconstruction recovery efforts for seafloor debris, a report shall be prepared by the Project Applicant and submitted to the City/Agency detailing, at a minimum, (1) recovery activities during deconstruction and post-deconstruction, (2) listings of all lost and recovered debris, (3) final disposition of recovered debris, and (4) discussion of what debris could not be recovered and why.

Mitigation measure MM BI-12b.1 would reduce the effects of construction-related activities to EFH by avoiding areas with submerged vegetation thereby protecting habitat, and managing construction equipment with Best Management Practices to prevent contamination. Mitigation measure MM BI-12b.2 would mandate the creation and implementation of a Seafloor Debris Removal Plan. This Plan shall include sufficient environmental protection measures to ensure effective recovery of lost Project debris and minimize potential environmental impacts posed by the debris, or debris recovery to designated EFH or other sensitive Bay habitats and biota (i.e., critical habitat and herring spawning habitats). Implementation of these mitigation measures would reduce potential adverse effects on EFH at HPS Phase II to less-than-significant levels.

[831] National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating. EPA 841-B-01-005, November 2001.

Impact of Yosemite Slough Bridge

Impact BI-12c **Construction of the Yosemite Slough bridge would not have a substantial adverse effect on designated essential fish habitat through (EFH) through placement of riprap and other fill, or through temporary water-quality impacts during construction. EFH is a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. (Less than Significant with Mitigation)** ***[Criterion N.b]***

Construction of the Yosemite Slough bridge would impact EFH through the construction of pilings required to support the bridge. As detailed in Table III.N-4, the amount of area impacted is approximately 1.28 acres of temporary impacts and 0.40 acre of permanent impacts, which includes both on site and off site areas. These impacts would have a substantial adverse effect on EFH because the function of portions

- of the impacted habitat would be permanently altered by the Project, a significant impact. In addition, shading from the bridge could adversely affect aquatic and mud flat habitat, and fish that use these habitats, under the bridge (refer to Impact BI-4c).

- Any loss or modification of EFH that would result from the Yosemite Slough bridge would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1 and MM BI-4c). Measures to avoid and minimize impacts to aquatic habitats, described in mitigation measure MM BI-4a.2, would further reduce impacts to EFH. To reduce these potential impacts to less-than-significant levels, mitigation measures MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would be implemented. Mitigation measure MM BI-12a.1 would reduce the effects of construction-related activities to EFH by establishing a construction window that would minimize impacts to fish by avoiding migration and breeding periods. Mitigation measure MM BI-12a.2 would ensure that personnel involved in deconstruction activities are trained on measures to avoid and minimize adverse effects to special-status aquatic species and their habitats. Mitigation measure MM BI-12b.1 would avoid areas with submerged vegetation thereby protecting habitat and manage construction equipment with Best Management Practices to prevent contamination. Mitigation measure MM BI-12b.2 would mandate the creation and implementation of a Seafloor Debris Removal Plan. This Plan shall include sufficient environmental protection measures to ensure effective recovery of lost Project debris and minimize potential environmental impacts posed by the debris, or debris recovery to designated EFH or other sensitive Bay habitats and biota (i.e., critical habitat and herring spawning habitats). Implementation of these mitigation measures would reduce potential adverse effects on EFH in Yosemite Slough to less-than-significant levels.

Impact BI-13: Wildlife Movement

Impact of Candlestick Point

Impact BI-13a **Construction at Candlestick Point would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites. (Less than Significant)** ***[Criterion N.d]***

As discussed in the Setting section, surveys of Candlestick Point and review of background studies did not identify any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide

substantial movement corridors or migratory pathways occur within Candlestick Point. No areas that would be considered nursery sites, which generally include some types of wetlands and avian rookeries, are found within Candlestick Point. The area surrounding Candlestick Point is part of the San Francisco Bay estuary, and the areas of the estuary affected by the Candlestick Point portion of the Project would be the existing shoreline structures. These structures would be replaced with new similar structures that would be designed to provide even higher-quality habitat for wildlife, including estuarine species, than the existing shoreline. In addition, although migratory fish could move though the open water and tidal portion of the site, Candlestick Point does not contain any migratory fish pathways such as anadromous fish streams or rivers (fish that breed in freshwater and spend adult lives in the ocean) and Project construction would not fragment habitat or create substantial barriers to movement though the adjacent waters. Consequently, construction at Candlestick Point would affect primarily terrestrial species well adapted to human disturbance that move locally within the Project site and the adjacent habitat patches. These common ground-dwelling vertebrates forage for food, mate, and move between habitat patches within the site and typically have small ranges that would limit their movement to localized use. Construction at Candlestick Point would not substantially interfere with this local movement as the wildlife would be able to continue their pre-Project activities in the areas not under construction, and construction would not permanently bar their movement through those portions of the site. Consequently, as the Project would not interfere substantially with the movement of native resident or migratory wildlife species, established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites, impacts would be less than significant. No mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-13b **Construction at HPS Phase II and construction of the Yosemite Slough bridge would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, but it could impede the use of native wildlife nursery sites. (Less than Significant with Mitigation)** ***[Criterion N.d]***

As discussed in the Setting section, surveys of HPS Phase II did not identify any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within HPS Phase II. Consequently, construction at HPS Phase II would affect primarily terrestrial species that are well adapted to human disturbance in the area and move locally within the Project site and between the adjacent habitat patches. These common ground-dwelling vertebrates forage for food, mate, and move between habitat patches within the site and typically have small ranges that would limit their movement to localized use. Construction of HPS Phase II would not substantially interfere with this local movement as the terrestrial wildlife would be able to continue their pre-Project activities in the areas not under construction, and construction would not permanently bar their movement through those portions of the site as the construction activities would be temporary.

The Yosemite Slough bridge would separate the upper part of Yosemite Slough, including the proposed restoration site, from South Basin and San Francisco Bay. This structure would not, however, substantially reduce the ability of fish or wildlife that currently move in and out of Yosemite Slough to continue doing so. The bridge's low, flat profile would allow birds to easily fly over the bridge between the upper part of

the slough and South Basin, but the bottom of the bridge deck is high enough to allow swimming birds such as ducks to swim under the bridge when tidal conditions would currently permit such movements. The bridge's piers would occupy only a very small fraction of the aquatic habitat within the bridge footprint, and thus fish and other aquatic species would be able to easily move in and out of the slough even after the bridge is constructed. Although the bridge and the road crossing it would impede movement of terrestrial species from one side of the bridge to the other, sufficient terrestrial space would be present above the high tide line at the abutments to allow terrestrial wildlife to pass under the bridge. Consequently, Project activities within HPS Phase II and Yosemite Slough would not substantially interfere with the movement of any native resident or migratory terrestrial species.

With respect to aquatic species, although migratory fish could move through the open water and the Yosemite Slough, HPS Phase II does not contain any substantial migratory fish pathways such as anadromous fish (fish that breed in freshwater and spend adult lives in the ocean) streams or rivers and Project construction, including the Yosemite Slough bridge, would not further fragment habitat or create substantial barriers to movement though the adjacent waters such to prevent aquatic species from moving freely along the coastline. However, as discussed in Impact BI-5b, construction of HPS Phase II components such as breakwaters and other shoreline treatments would occur near eelgrass beds, which could remove them or indirectly impact them such that productivity and survival of these habitats would be reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be a significant impact, as it would substantially impede the use of the only two patches of eelgrass habitat (wildlife nursery sites) in the HPS Phase II site. To reduce these impacts, mitigation measures MM BI-5b.1 through MM BI-5b.4 would be implemented.

Implementation of mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects of HPS Phase II construction on eelgrass by avoiding impacts through initial design if feasible; determining the locations of eelgrass beds through surveys; using survey data to refine shoreline treatments to further avoid or minimize impacts to eelgrass; and compensating for unavoidable impacts through the creation or restoration of eelgrass beds at a 3:1 ratio. Consequently, implementation of these measures would reduce impacts to eelgrass beds, and thus to nursery sites, to less-than-significant levels. This would ensure that construction of HPS Phase II would not interfere substantially with the use of native wildlife nursery sites. Implementation of these mitigation measures would reduce this impact to a less-than-significant level.

Impact BI-14: Local Plans and Policies

Impact of Candlestick Point

Impact BI-14a **Construction at Candlestick Point would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation)** ***[Criterion N.e]***

The *City of San Francisco General Plan* articulates broad policies to protect natural resources and federally and state listed species, and work with federal and state agencies. The General Plan does not identify any additional, specific resources for protection beyond those identified by federal and state agencies. This document analyzes the impacts of the project on natural resources identified for protection by such federal and state policies, and identifies mitigation measures to reduce or avoid significant impacts. The Project would not, therefore, conflict with the natural resource protection policies of the General Plan.

In addition, the City has adopted an Urban Forestry Ordinance to protect street trees within the jurisdiction of the DPW, and significant and landmark trees within the jurisdiction of the DPW or on private property. Section 143 of the City's Planning Code requires the planting of street trees when constructing new buildings within specified land use districts. According to the City's registry of "landmark trees", no such trees are present on Candlestick Point or elsewhere in the Project area.[832] A tree survey[833] was conducted within all of the Project site except the portion of CPSRA that is not subject to the land transfer and is thus not subject to direct impacts from this Project. This survey identified approximately 1,976 "tree"[834] stems emanating from 1,068 individual plants on Candlestick Point. Of these, approximately 1,079 stems meet the size criteria for "significant trees", as defined by the Urban Forestry Ordinance, and any of these trees that is (1) on property under the jurisdiction of the Department of Public Works or (2) on privately owned-property with any portion of its trunk within 10 feet of the public right-of-way would be considered a significant tree. Likewise, any of the 1,976 trees on Candlestick Point growing within the public right-of-way or on land under the jurisdiction of the Department of Public Works would be considered a "street tree"; some trees meet the criteria of both significant trees and street trees. The vast majority of these trees consisted of multiple-stemmed myoporum; eucalyptus, pines, and olives were also well represented. All four of these species are non-natives.

Construction activities associated with Candlestick Point could result in disturbance or loss of trees within DPW jurisdiction. These trees would be subject to the requirements of the *Public Works Code*, which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The *Planning Code* does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143. Mitigation measure MM BI-14a would ensure that development in Candlestick Point does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143.

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832 http://www.sfenvironment.org/our_programs/interests.html?ssi=4&ti=8&ii=131.
833 H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.
834 For the purpose of this survey, any stem of a woody plant with a tree-like (as opposed to shrubby) growth habit measuring at least 2 inches in diameter at a height of 4.5 feet above the ground was considered a "tree."

MM BI-14a *Preservation and Replacement of Significant Trees, and Preservation and Planting of Street Trees. Construction activities outside of the Department of Public Works (DPW) jurisdiction could result in the disturbance or removal of a large number of trees. To minimize this impact, the following measures shall be implemented by the Project Applicant in these areas:*

1. *Avoidance of the removal of trees that meet the size specifications of significant trees in the Public Works Code Article 16 shall occur to the maximum extent feasible, and any such trees that are removed shall be replaced at a minimum of 1:1 (1 impacted:1 replaced). The species used for replacement shall be consistent with DPW recommendations.*
2. *Street trees shall be planted in all new development areas. The species, size, and locations shall be consistent with the requirements specified in Planning Code Section 143, including, but not limited to, the following:*
    a) *The street trees installed shall be a minimum of one 24-inch box tree for each 20 feet of frontage of the property along each street or alley, with any remaining fraction of 10 feet or more of frontage requiring an additional tree. Such trees shall be located either within a setback area on the lot or within the public right-of-way along such lot.*
    b) *The species of trees selected shall be suitable for the site, and, in the case of trees installed in the public right-of-way, the species and locations shall be subject to the approval by the DPW. Procedures and other requirements for the installation, maintenance, and protection of trees in the public right-of-way shall be as set forth in* Public Works Code *Article 16.*
3. *If a significant tree or street tree will not be removed, but construction activities will occur within the dripline of such trees, a Tree Protection Plan shall be prepared by an International Society of Arboriculture (ISA) certified arborist, in accordance with the Urban Forestry Ordinance. This plan shall be submitted to the Planning Department for review and approval prior to issuance of a demolition or building permit. The Tree Protection Plan shall include measures to protect all parts of a tree from disturbance during construction, and may include the following:*
    a) *A site plan with tree species, trunk location, trunk diameter at breast height, and the canopy dripline area within development*
    b) *The use of protective fencing to establish an area to be left undisturbed during construction*
    c) *Protection specifications, including construction specifications such as boring instead of trenching for utility lines, or tree specifications such as drainage, fertilization, or irrigation measures*
    d) *Pruning specifications, if needed, to preserve the health of the tree and allow construction to proceed*

Mitigation measure MM BI-14a would encourage the preservation of street trees and trees that are large enough to meet the size specification of significant trees in the *Public Works Code*, and would require the replacement of large trees that are removed. Further, it would require the planting of street trees consistent with the intent of the *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. With implementation of mitigation measures MM BI-14a and MM BI-7b, the Project would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees. Impacts would be less than significant.

Further, the Draft Parks, Open Space, and Habitat Concept Plan (as required by mitigation measure MM BI-7b) includes the planting of approximately 10,000 net new trees, avoids removal of native trees

where feasible, and establishes new parkland and open space that would include a predominance of native species (see Impact BI-2 and Impact BI-7b). The planting of an estimated 10,000 net new trees at the Project site and in the community would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. Consequently, development of Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, and overall impacts would be beneficial.

Impact of Hunters Point Shipyard Phase II

Impact BI-14b **Construction at HPS Phase II and Yosemite Slough bridge would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation) *[Criterion N.e]***

Similar to development at Candlestick Point, construction activities associated with HPS Phase II would be consistent with the policies of the *City of San Francisco General Plan* relating to biological resources. In addition, the City has adopted an Urban Forestry Ordinance to protect street trees within the jurisdiction of the DPW, and significant and landmark trees within the jurisdiction of the DPW or on private property. Section 143 of the City's Planning Code also regulates the planting of street trees associated with construction of buildings within specified land use districts. According to the City's registry of "landmark trees", no such trees are present on HPS Phase II or elsewhere in the Project area.[835] A tree survey[836] conducted for the Project identified approximately 854 "tree" stems emanating from 328 individual plants on HPS Phase II. Of these, approximately 400 stems meet the size criteria for "significant trees", as defined by the Urban Forestry Ordinance. Although most of HPS Phase II is within the jurisdiction of the Navy, if and any of these trees are (1) on property under the jurisdiction of the Department of Public Works or (2) on privately owned-property with any portion of its trunk within 10 feet of the public right-of-way, it would be considered a significant tree under the Urban Forestry Ordinance. Likewise, any of the 854 trees on HPS Phase II growing within the public right-of-way or on land under the jurisdiction of the Department of Public Works would be considered a "street tree"; some trees meet the criteria of both significant trees and street trees. Trees recorded on HPS Phase II during the tree survey were dominated by small, multi-stemmed toyon (*Heteromeles arbutifolia*; a native species, though the trees on HPS appear to be of an ornamental variety) and several non-natives, including London planetree (*Platanus* x *acerifolia*) and acacia (*Acacia* spp.).

Construction activities associated with HPS Phase II could result in disturbance or loss of trees within DPW jurisdiction, including areas outside of the Navy's property (i.e., City streets adjoining the HPS Phase II areas) or within on-site and off-site areas of Yosemite Slough (i.e., where construction of infrastructure may occur). These trees would be subject to the requirements of the *Public Works Code*, which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

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[835] http://www.sfenvironment.org/our_programs/interests.html?ssi=4&ti=8&ii=131.
[836] H.T. Harvey & Associates, *Candlestick Point/Hunters Point Shipyard Tree Survey*. October 16, 2009.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The *Planning Code* does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143. Mitigation measure MM BI-14a would ensure that development in HPS Phase II does not result in conflicts with these policies by requiring preservation of street trees and trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. Therefore, with implementation of mitigation measure MM BI-14a, impacts would be less than significant.

Further, the Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) includes the planting of approximately 10,000 net new trees at the Project site and in the community, avoids removal of native trees where feasible, and establishes new parkland and open space that would include a predominance of native species (refer to Impact BI-2 and Impact BI-7b). The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area, increase canopy cover, and promote a healthy and sustainable urban forest. Consequently, development of HPS Phase II and construction of the Yosemite Slough bridge would not conflict with any local policies or ordinances protecting biological resources, and overall impacts would be beneficial.

Impact BI-15: Contaminated Soils or Sediments during Construction

Impact of Candlestick Point

Impact BI-15a **Construction within the shoreline or Bay at Candlestick Point would not result in the disturbance of contaminated soil or the re-suspension of contaminated sediments. (No Impact)** ***[Criteria N.a and N.b]***

There are no sites with known contamination requiring remediation at Candlestick Point. Therefore, fish or wildlife species, and aquatic communities would not be exposed to contaminated fill or Bay/shoreline sediments during construction activities, and there would be no impact. No mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-15b **Construction within the shoreline or Bay at HPS Phase II would not result in the disturbance of contaminated soil or the re-suspension of contaminated sediments. (Less than Significant with Mitigation)** ***[Criteria N.a and N.b]***

As discussed in Section III.K (Hazards and Hazardous Materials) of this EIR, chemicals and radioactive materials are present in soil and groundwater in various locations throughout the HPS Phase II site at levels that require remediation. Disturbance of fill or shoreline sediments, and associated stockpiling and on-site soil movement, during construction could provide potential pathways through which fish and wildlife

species could be exposed to contaminants in fill material or Bay/shoreline sediments. Exposure of fish and wildlife to such contaminants could potentially impair the health or productivity of exposed individuals, or could have food-chain effects on species that prey upon exposed individuals through bioconcentration of contaminants. Contaminant exposure that adversely affects the health or productivity of special-status fish or wildlife species, or that adversely affects large numbers of individuals of common fish and wildlife species, would be considered a substantial adverse effect.

As discussed in Section III.K, the Navy is responsible for some remediation activities (i.e., radiological contamination) on HPS Phase II. Because contaminants have been identified in those parcels for which remedial actions have been selected but not yet implemented by the Navy, construction of shoreline improvements has the potential to disturb sediment or soil that may contain chemical contaminants. However, if the Navy does not complete its remediation activities in advance of Project activities, the San Francisco Redevelopment Agency (Agency) or the Project Applicant would implement the remaining remediation activities in conjunction with shoreline improvement activities, with appropriate regulatory oversight, as required by mitigation measure MM HZ-10b. Impact HZ-10b discusses the process that would be followed by Agency or the Project Applicant in conjunction with development activities with appropriate regulatory oversight to manage potentially contaminated sediments that could be affected by Project shoreline improvements.

In addition, as discussed in Section III.M (Hydrology and Water Quality) of this EIR, implementation of measures to control stormwater runoff during construction would control discharge of potential chemicals adhered to soil in the runoff. Mitigation measures MM HY-1a.1 and MM HY-1a.2 would require preparation of a SWPPP to identify the specific measures and BMPs that are applicable to HPS Phase II construction activities in the event of a spill of construction materials or exposure of hazardous materials. This would reduce the likelihood of contaminants being conveyed to near-shore and offshore environments, which would reduce the risk to the aquatic environment and species that rely on that habitat (e.g., birds and mammals).

Implementation of mitigation measures MM HZ-10b, MM HY-1a.1, and MM HY-1a.2 would reduce the exposure of fish or wildlife to contaminated fill or Bay/shoreline sediments during construction activities, and adverse effects would be less than significant.

Operational Impacts

Impact BI-16: Sensitive Birds and Marine Mammals

Impact of Candlestick Point

Impact BI-16a **Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS or interfere substantially with the movement of any native resident or migratory fish, or impede the use of native wildlife nursery sites. (Less than Significant)** ***[Criteria N.a and N.d.]***

Operation of the development at Candlestick Point does not contain an in-water operational component and would not impact birds or marine mammals within the waters of the Bay. There are no known marine mammal pupping sites or major haulout locations within Candlestick Point where animals would be subject to increased disturbance during operation. Consequently, operation of Project components at Candlestick Point would not have a substantial adverse effect on these sensitive aquatic resources.

Human activity at Candlestick Point following completion of construction would affect wildlife, including invertebrates, reptiles, amphibians, birds, and mammals. Potential adverse effects include disturbance of individuals (including nesting birds) in terrestrial, shoreline, and aquatic habitats due to movement by humans, domestic animals, and vehicles; depredation of native species by domestic animals; injury or mortality of individuals due to vehicular traffic; and other impacts. In addition, an increase in trash, particularly food waste, could potentially subsidize nuisance species, which in turn could increase predation on more sensitive wildlife species. However, as discussed in Impact BI-2, adverse effects of human disturbance and other operational factors would occur primarily to small numbers of regionally abundant species, and operational impacts would not substantially affect populations of these species. Impacts would be less than significant, and no mitigation is required.

Furthermore, for many of these common species, adverse effects of human disturbance on local (i.e., Project-wide) numbers would be offset by the benefits of habitat improvements incorporated into the Project's Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b). Thus, operational activities at Candlestick Point would benefit terrestrial biological resources.

Impact of Hunters Point Shipyard Phase II

Impact BI-16b **Implementation of the Project at HPS Phase II, including operation of the proposed marina, would not have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS or interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant)** ***[Criteria N.a and N.d.]***

Operation of the marina and marina-related activities (personal watercraft operations) would have the potential to disturb marine mammals and birds. The marine mammals most likely to be disturbed are locally foraging harbor seals. There are no known pupping sites or major haulout locations where animals would be subject to increased disturbance from vessel traffic from the Project. San Francisco Bay provides resting and foraging habitat for a variety of waterfowl migrating along the Pacific flyway. These birds often congregate into relatively large rafts of birds. Those rafts are subject to the disturbance from noise, size, speed, and wakes generated by vessel traffic. The common response to disturbance is for the birds to fly off the water surface and fly some distance away and land. Both the marina and marina-related (personal watercraft operations) activities would increase the disturbance to birds resting and foraging on Bay waters. However, out of a 300-slip marina, only a small percentage of the boats docked there are expected to be in use at any one time. Considering the size of the Bay, the number of boats currently on the bay at any one time, and the amount of disturbance currently generated by the existing boats on the Bay, the few

boats that at any one time are moving from the proposed marina into the Bay are not expected to generate substantial additional disturbance over current conditions. Consequently, they would not have substantial adverse effects on migrating or resting waterfowl.

Piers 1, 2, and 3 at the south side of HPS Phase II would be separated from the shore, but would remain in place. Those piers could provide resting, and potentially nesting, habitat for gulls, terns, and other marine-oriented species. Recreational use of the area would be limited to fishing from boats; however, the water is relatively shallow and not likely to support substantial populations of sportfish such that large amounts of angler (recreational fishermen) disturbance would be generated at any one time. Also, the existing piers are well above the water surface, separating resting birds from direct interaction with anglers. Therefore, recreational boating or fishing in this area would not be expected to substantially affect birds using or traveling to and from those piers. For these reasons, the operation of the marina and marina-related activities the marina would not have a substantial adverse effect on marine mammals and resting waterfowl.

Human activity at HPS Phase II following completion of construction would affect wildlife, including invertebrates, reptiles, amphibians, birds, and mammals, as described above for Candlestick Point. However, adverse effects of human disturbance and other operational factors would not substantially affect populations of these species. Impacts would be less than significant, and no mitigation is required.

Furthermore, for many of these common species, adverse effects of human disturbance on local (i.e., Project-wide) numbers would be offset by the benefits of habitat improvements incorporated into the Project's Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b). Thus, operational activities on HPS Phase II would benefit terrestrial biological resources.

Impact BI-17: Nesting American Peregrine Falcons

Impact of Candlestick Point

Impact BI-17a **Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on nesting American peregrine falcons, identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact)** ***[Criterion N.a]***

No American peregrine falcons nests are found within Candlestick Point. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-17b **Implementation of the Project at HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on nesting American peregrine falcons, identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. (No Impact)** ***[Criterion N.a]***

As previously discussed under Impact BI-6b, a resident pair of American peregrine falcons has been observed successfully nesting on the Re-gunning crane on Parcel D of HPS Phase II. The Project's operations would not result in substantial adverse effects to the falcons' nesting activities as the nesting

pair currently present has persisted, and nested successfully, at this site for several years even while remediation activities have been ongoing in the vicinity of the nest site. Many pairs of this species nest in high disturbance and heavily illuminated locations such as the towers in downtown San Francisco (i.e., the Pacific Gas and Electric Company's Headquarters) and the Bay Bridge (adjacent to construction activities). Operation activities of the Project would not result in substantial adverse effects on nesting American peregrine falcons. No impact would occur, and no mitigation is required.

Impact BI-18: Sensitive Aquatic Species, Mollusks, and Designated EFH

Impact of Candlestick Point

Impact BI-18a **Implementation of the Project at Candlestick Point would not have a substantial adverse effect, either directly or through habitat modifications, on aquatic species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the NMFS. (No Impact)** ***[Criteria N.a and N.b]***

Operational activities within Candlestick Point do not contain an in-water operational component and would not generate increases in turbidity or other impacts that could adversely affect species identified as a candidate, sensitive, or special-status, or designated EFH. Rather, the shoreline improvements would reduce erosion relative to existing conditions, thus reducing the potential for any re-suspension of sediments. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-18b **Implementation of the marina in HPS Phase II would require routine maintenance dredging of the marina, which could remove habitat or generate substantial increases in turbidity within the marina, but would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the NMFS. (Less than Significant with Mitigation)** ***[Criteria N.a and N.b]***

Routine dredging of the marina could be required to maintain operational depth over the life of the Project. Dredging of marinas typically involves a clamshell excavator, which is used to physically remove sediments that are then transported off site for disposal. This method of sediment removal results in massive suspension of Bay mud. Those particles eventually settle out onto the seafloor and surrounding substrates. Up to several inches of new sediment deposition is possible. This would result in Project effects on sensitive species and EFH through two avenues.

The first is alteration of or removal of habitat, which occurs when this sediment settles out onto native oysters or spawning substrate for herring (there is no known eelgrass within the marina location). Oysters require hard substrates to attach to and are unable to move above layers of sediment as they are deposited.

Oysters are likely found on most hard substrates within the area and would settle onto the new breakwaters, piers, and floating dock system. Increased rates of sediment accumulation could decrease their survival. Pacific herring attach their eggs to had substrates and aquatic vegetation (docks, pilings, piers, eelgrass, etc). Sediment accumulation that would affect herring would only occur on relatively flat substrates (i.e., riprap). Because herring can spawn on vertical substrates (i.e., piers or breakwaters) and they can actively choose spawning habitats, the deposition of sediment within the marina would not result in a substantial reduction in available habitat.

The second avenue of potential impact could occur if the sediment plume disrupts behavior of fish managed under EFH regulations. These disturbances are expected to be temporary because fish can swim away from the plume and dredging operations. Because of this, maintenance dredging of the marina would have only a temporary impact on these species, and this is considered a less-than-significant impact. Pacific herring could spawn within the marina, but all dredging windows for the Bay do not allow dredging to occur during the spawning season, and, therefore, dredging would not impact spawning herring resource.

Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina maintenance dredging to less-than-significant levels by requiring compensatory mitigation for impacts to oysters and EFH that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat and EFH. Mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities. Consequently, implementation of both measures would reduce adverse effects of sedimentation associated with dredging to less-than-significant levels.

MM BI-18b.1 *Maintenance Dredging and Turbidity Minimization Measures for the Operation of the Marina. Maintenance dredging for the marina could remove or generate sediment plumes that could impact special-status species, their habitats, and Essential Fish Habitat (EFH). To minimize this effect, the following measures shall be implemented by the Project Applicant:*

1. *Conduct a detailed survey for native oysters in all suitable substrates within the marina, which includes the area between the land and breakwaters, after construction of the new breakwaters. This survey shall be conducted by a qualified oyster biologist at low tides that expose the maximum amount of substrate possible. Surveys can be conducted at any time of year, but late summer and early fall are optimal because newly settled oysters are detectable. This survey shall occur before any construction within the proposed marina location takes place to establish a baseline condition. If few or no oysters are observed on hard substrates that would remain in place after dredging, no further mitigation is required.*
2. *If oysters are found at densities at or above 90 oysters per square meter*[837] *on suitable oyster-settlement substrates that would be removed or in areas where dredging sediment could settle out onto the oysters, a detailed sediment plume modeling study of the proposed marina operation shall be conducted to determine if the operations and maintenance of the marina would generate a substantial plume of sediment. This model shall include the local bathymetry and sediment information, tidal data, and detailed marina information (number and types of boats, etc). The model shall be prepared by a qualified harbor engineer (as approved by the City/Agency) with direct experience in this type of work within San Francisco Bay, prior to issuance of any permits for the construction of features directly associated with the marina. A report documenting modeling*

[837] MACTEC Engineering and Consulting, Inc. 2008. *Oyster Point Marina Olympia Oyster Surveys Pre- and Post-Dredging February 2008, Oyster Point Marina, South San Francisco, California*. Prepared for PBS&J; Obernolte. 2009. Personal communication between MACTEC and PBS&J.

methods, input data, assumptions, results, and implications for increased rates of sedimentation shall be prepared and provided to NMFS during the USACE-directed Section 7 and EFH consultation for the marina. If the model demonstrates minimal sediment resuspension that would settle out before reaching sensitive habitats, no further mitigation is required.

3. *If the sediment plume reaches sensitive shoreline habitats (substrates that support native oysters), compensatory mitigation shall be provided by the Project Applicant at a ratio recommended by NMFS for the type of habitat adversely affected. The Project Applicant shall retain a qualified oyster biologist (as approved by the City/Agency) to develop an Oyster Restoration Plan that shall be reviewed and approved by the City/Agency. This Plan shall include site selection, substrate installation, and monitoring procedures, and include the following components (unless otherwise modified by NMFS):*

   > *A suitable site for installation of replacement substrate would be one with adequate daily tidal flow, a location that would not be affected by maintenance dredging or other routine marina maintenance activities, and one that is lacking in appropriate settlement substrate. A location outside of the new breakwaters or in association with any eelgrass mitigation sites would be appropriate.*

   > *Although oysters would settle on a variety of materials, the most appropriate for restoration purposes is oyster shell. This is typically installed by placing the shell into mesh bags that can then be placed in piles on the seafloor of the mitigation site. Enough shell shall be installed under the guidance of a qualified oyster biologist to make up for the loss attributable to the Project. Mitigation shall occur after construction of all in-water elements of the Project within HPS Phase II.*

   > *The restoration site shall be monitored on a regular basis by a qualified oyster biologist for a minimum of two years, or until success criteria are achieved if they are not achieved within two years. Monitoring shall involve routine checks (bi-monthly during the winter and monthly during the spring and summer) to evaluate settlement, growth, and survival on the mitigation site. Success shall be determined to have been achieved when settlement and survival rates for oysters are not statistically significantly different between the mitigation site and either populations being impacted (if data are available) or nearby established populations (i.e., Oyster Point Marina).*

MM BI-18b.2 *Implement BMPs to Reduce Impacts of Dredging To Water Quality. BMPs established in Appendix I of the Long-Term Management Strategy (LTMS) for management of disposal of dredge material in San Francisco Bay are designed specifically to minimize spread of contaminants Long-Term Management Strategy (LTMS) outside of dredge areas. All of these elements of the LTMS shall be applied to any proposed dredging or construction activities associated with the Project unless otherwise modified by the USACE, BCDC, or SFRWQCB in permit conditions associated with the proposed dredging activities associated with this Project (same as MM BI-19b.2).*

Impact BI-19: Contaminated Sediments during Operation

Impact of Candlestick Point

Impact BI-19a **Implementation of the Project at Candlestick Point would not result in impacts to aquatic organisms through the re-suspension of contaminated sediments. (No Impact) *[Criteria N.a and N.b]***

Operational activities within Candlestick Point do not contain an in-water operational component and would not result in the re-suspension of contaminated sediments that could have health consequences for

sensitive fish species and degrade EFH. Rather, the shoreline improvements would reduce erosion relative to existing conditions, thus reducing the potential for any re-suspension of contaminants. No impact would occur, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact BI-19b **Implementation of the marina in HPS Phase II would not have a substantial adverse effect, either directly or through habitat modifications, on sensitive aquatic species, identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS, or have a substantial adverse effect on designated EFH, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS, or have a substantial effect on predators that prey on contaminated species or feed on contaminated substrates as a result of routine maintenance dredging or could generate routine increases in turbidity within the marina that would result in the re-suspension of contaminated sediments. (Less than Significant with Mitigation)** ***[Criteria N.a and N.b]***

Much of the seafloor within the Study Area is contaminated from decades of industrial use.[838] The primary contaminants are metals such as copper, lead, mercury, and polychlorinated biphenyl (PCBs), concentrations of which diminish with distance from the shoreline.[839] Routine dredging activities required to maintain operational depth of the marina could result in the suspension of contaminated sediments from the seafloor. Contaminants in these sediments may be taken up by aquatic organisms, either within the marina or in other areas to which contaminated sediments are carried by tides or currents. The uptake of contaminated food sources or exposure to elevated levels of toxins can reduce reproductive success, alter blood chemistry, suppress a fish's immune systems, and result in an increased risk of disease and mortality.[840,841] These effects may occur in aquatic organisms that take up contaminated substances directly, wildlife species (such as shorebirds) that forage in contaminated substrates, or predators that feed on prey that have taken up contaminants. Such impacts are potentially significant.

To reduce these impacts to less-than-significant levels, the following mitigation measures would be implemented.

MM BI-19b.1 *Work Windows to Reduce Maintenance Dredging Impacts to Fish during Operation of the Marina. According to the Long-Term Management Strategy (LTMS), dredging Projects that occur during the designated work windows do not need to consult with NMFS under the federal* Endangered Species

838 Barajas and Associates, Inc. 2008. Final Feasibility Study Report for Parcel F, Hunters Point Shipyard, San Francisco, California. Prepared for Base Realignment and Closure Program Management Office West.
839 Barajas and Associates, Inc. 2008. Final Feasibility Study Report for Parcel F, Hunters Point Shipyard, San Francisco, California. Prepared for Base Realignment and Closure Program Management Office West.
840 Jacobson, K.C., M.R. Arkoosh, A.N. Kagley, E.R. Clemons, and T.K. Collier, 2003. Cumulative Effects of Natural and Anthropogenic Stress on Immune Function and Disease Resistance in Juvenile Chinook Salmon, *Journal of Aquatic Animal Health*, 15: 1-12.
841 Landhal, J.T., L.L. Johnson, J.E. Stein, T.K. Collier, and U. Varanasi, 1997. Approaches for determining affects of pollution on fish populations in Puget Sound. *Transactions of the American Fisheries Society* 126: 519-535.

Act *(FESA).*[842] *The window in which dredging is allowed for the protection of steelhead in the central Bay is June 1 to November 30. The spawning season for the Pacific herring is March 1 to November 30.*[843] *Therefore, the window that shall be applied to minimize impacts to sensitive fish species is December 1 to February 28, upon consultation with NMFS.*

MM BI-19b.2 *Implement BMPs to Reduce Impacts of Dredging To Water Quality. BMPs established in Appendix I of the Long-Term Management Strategy (LTMS) are designed specifically to minimize spread of contaminants outside of dredge areas. All of these elements of the LTMS shall be applied to any proposed dredging or construction activities associated with the Project unless otherwise modified by the USACE, BCDC, or the San Francisco Bay Regional Water Quality Control Board in permit conditions associated with the proposed dredging activities associated with this Project (same as MM BI-18b.2).*

Implementation of mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce contamination associated with dredging to less-than-significant levels by (1) reducing the effects of increased contamination resulting from routine maintenance dredging by requiring that dredging occur during established work windows when sensitive fish species are less likely to be present, and (2) mandating application of BMPs to control the distribution of sediments disturbed by the dredging activities. Consequently, implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact BI-20: Wildlife Movement

Impact of Candlestick Point

Impact BI-20a **Implementation of the Project at Candlestick Point would not interfere substantially with the movement of resident or migratory bird species by increasing collision hazards and the amount of artificial lighting. (Less than Significant with Mitigation)** ***[Criterion N.d]***

The Project would be located along the Pacific Flyway for migratory birds. Migrating birds, such as songbirds, can be affected by human-built structures because of their propensity to migrate at night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions.[844] In addition, birds migrating at night are strongly attracted to sources of artificial light, particularly during periods of inclement weather.[845] Exposure to a light field at night can cause alteration of a straight flight path, and the change in flight path would keep the bird near the light source longer than if the flight path remained straight.[846] Brightly lit buildings can confuse migrating birds, trapping them in the bright light, which they are reluctant to fly out of, until they are exhausted or collide

[842] US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001.
[843] US Army Corps of Engineers, US Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board. Long-term Management Strategy for the Placement of Dredge Material in the San Francisco Bay, Management Plan 2001; Appendix F.
[844] Gauthreaux, S.A. Jr. and C. Belser., Ecological Consequences of Artificial Night Lighting: Effects of Artificial Night Lighting on Migrating Birds, Island Press, Washington, 2006.
[845] Ibid.
[846] Ibid.

with a building.[847] Confused by artificial lights, blinded by the weather, and unable to see glass, large numbers of birds have been documented being injured or killed by colliding with buildings in eastern and midwestern North America.[848] Summaries of documented mortality from bird collisions have almost invariably focused on mortality in those regions, however, and large-scale mortality at buildings on the West Coast has not been reported.[849,850]

At Candlestick Point, residential towers would range from 200 to 420 feet in height and the majority of local bird movement would be expected to be along the shoreline of San Francisco Bay, especially for shorebirds, as they move from foraging habitat to perching or roosting habitats in response to changes in the tide. Because the existing structures are relatively low (i.e., Candlestick Park stadium), the risk of bird strikes under existing conditions is expected to be minimal. New buildings from 200 to 420 feet in height would constitute a substantial increase in obstacles within flight paths when compared to existing conditions. The Project would create bird strike hazards at elevations that do not currently exist. With structures 400 feet tall or taller and windy, often foggy conditions found along San Francisco Bay, the risk of collision for birds would increase. Therefore, the Project could result in the creation of a new strike hazard for migrating birds that could result in loss of substantial numbers of birds over the life of the Project. Additionally, operating effects associated with the lighting of the towers can alter the flight patterns of migratory birds and potentially increase bird strike collisions with the tall buildings.

Although large-scale injury or mortality of birds due to collisions with buildings has not been reported from the West Coast, there is some potential for such mortality to occur in the absence of mitigation measures. Because of these potential effects, the Project is considered to have a potentially significant impact to migratory birds.

To reduce these impacts the following mitigation measures would be implemented.

MM BI-20a.1 *Lighting Measures to Reduce Impacts to Birds. During design of any building greater than 100 feet tall, the Project Applicant and architect shall consult with a qualified biologist experienced with bird strikes and building/lighting design issues (as approved by the City/Agency) to identify lighting-related measures to minimize the effects of the building's lighting on birds. Such measures, which may include the following and/or other measures, will be incorporated into the building's design and operation.*

- *Use strobe or flashing lights in place of continuously burning lights for obstruction lighting. Use flashing white lights rather than continuous light, red light, or rotating beams.*
- *Install shields onto light sources not necessary for air traffic to direct light towards the ground.*
- *Extinguish all exterior lighting (i.e., rooftop floods, perimeter spots) not required for public safety.*
- *When interior or exterior lights must be left on at night, the operator of the buildings shall examine and adopt alternatives to bright, all-night, floor-wide lighting, which may include:*
  - *Installing motion-sensitive lighting.*

847 Keyes, T., *Building Bird Strike Study*, The Citizen Scientist, Non-game-Endangered Wildlife Program, 2005.
848 Ogden, L.J., *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds*, Wildlife Damage Management, Internet Center for Fatal Light Awareness Program (FLAP), University of Nebraska, 1996.
849 Avery, M.L. 1979. Review of Avian Mortality due to Collisions with Manmade Structures. Wildlife Damage Management, Internet Center for Bird Control Seminars Proceedings.
850 Klem, D., Jr. 1990. Collisions between Birds and Windows: Mortality and Prevention. Journal of Field Ornithology 61:120-128.

- *Using desk lamps and task lighting.*
- *Reprogramming timers.*
- *Use of lower-intensity lighting.*

- *Windows or window treatments that reduce transmission of light out of the building will be implemented to the extent feasible.*
- *Educational materials will be provided to building occupants encouraging them to minimize light transmission from windows, especially during peak spring and fall migratory periods, by turning off unnecessary lighting and/or closing drapes and blinds at night.*
- *A report of the lighting alternatives considered and adopted shall be provided to the City/Agency for review and approval prior to construction. The City/Agency shall ensure that lighting-related measures to reduce the risk of bird collisions have been incorporated into the design of such buildings to the extent practicable.*

MM BI-20a.2 *Building Design Measures to Minimize Bird Strike Risk. During design of any building greater than 100 feet tall, the Project Applicant and architect will consult with a qualified biologist experienced with bird strikes and building/lighting design issues (as approved by the City/Agency) to identify measures related to the external appearance of the building to minimize the risk of bird strikes. Such measures, which may include the following and/or other measures, will be incorporated into the building's design.*

- *Use non-reflective tinted glass.*
- *Use window films to make windows visible to birds from the outside.*
- *Use external surfaces/designs that "break up" reflective surfaces.*
- *Place bird attractants, such as bird feeders and baths, at least 3 feet and preferably 30 feet or more from windows in order to reduce collision mortality.*
- *A report of the design measures considered and adopted shall be provided to the City/Agency for review and approval prior to construction. The City/Agency shall ensure that building design-related measures to reduce the risk of bird collisions have been incorporated to the extent practicable.*

Measures such as these have been recommended by a number of authors and organizations to reduce the potential for avian collisions with buildings.[851,852,853,854,855,856] As discussed by Klem, "there are many solutions that effectively reduce or eliminate bird strikes" at buildings,[857] and mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating these solutions. Specifically, these measures would reduce the incidence of bird strikes by requiring operational methods to reduce the effects of artificial lighting; making the structure (especially the glass surfaces) more visible from the outside with the use of external window coverings; and creating non-reflective or interference zones on or inside the glass. These measures

[851] Lights Out San Francisco. Golden Gate Audubon Society. http://www.goldengateaudubon.org/html/conservation/lightsoutsf/lightsoutsf_main.htm.
[852] Klem, D., Jr. Collisions between Birds and Windows: Mortality and Prevention. Journal of Field Ornithology 61:120-128.
[853] New York City Audubon. 2007. Bird-Safe Building Guidelines.
[854] Doeker, R. Bird-Safe Design Practices. www.birdsandbuildings.org.
[855] Bates, R. 2008. Building Bird Strike Minimization: Analysis of Applicable Technologies. Kieran Timberlake Associates.
[856] City of Toronto Green Development Standard. 2007. Bird-Friendly Development Guidelines.
[857] Klem, D., Jr. Sheet Glass: An Invisible and Lethal Hazard for Birds. http://www.windowcollisions.info/public/WK-Policy-Stat-Handout-03.pdf.

are promoted in eastern and midwestern cities such as Toronto, Chicago, and New York City where avian collisions with buildings have been much better documented than on the West Coast, and implementation of these mitigation measures would reduce potential adverse effects to less-than-significant levels.

Impact of Hunters Point Shipyard Phase II

Impact BI-20b **Implementation of the Project at HPS Phase II would not interfere substantially with the movement of resident or migratory bird species by increasing collision hazards and the amount of artificial lighting. (Less than Significant with Mitigation)** ***[Criterion N.d]***

Within HPS Phase II, the towers would range from 240 to 350 feet in height, and the 49ers Stadium would be up to 156 feet in height with the top of the stadium light towers at 192 feet. Migrating birds such as songbirds can be affected by human-built structures because of their propensity to migrate at night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions. Both tall structures and residential windows provide collision hazards to migrating birds. A majority of bird strikes occur when birds do not recognize windows on buildings. Thus, operation of the towers and stadium would pose collision hazards to migratory birds as effects associated with the lighting of the towers can alter the flight patterns of migratory birds and substantially increase bird strike collisions with the structures. As discussed under Impact BI-20a, large-scale avian injury or mortality due to bird strikes has not been documented at buildings on the West Coast as it has in eastern and midwestern North America. However, due to the potential for bird strikes at tall buildings on HPS Phase II, this would be a potentially significant impact.

Implementation of mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating birds to less-than-significant levels by incorporating design features that would help minimize bird strike, including using operation methods to reduce the effects of artificial lighting; making the structure, especially the glass surfaces, more visible from the outside with the use of external window coverings; and the creation of non-reflective or interference zones on or inside the glass. Consequently, implementation of these mitigation measures would reduce this impact to a less-than-significant level.

Impact BI-21: Local Plans and Policies

Impact of Candlestick Point

Impact BI-21a **Implementation of the Project at Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant With Mitigation)** ***[Criterion N.e]***

As discussed in the consistency analysis for local policies in the Regulatory discussion above, operation of Candlestick Point would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. In addition, the City has adopted an Urban Forestry Ordinance and Section 143 of the Planning Code to protect trees as a significant resource to the community, and as discussed in Impact BI-14a, the Project's construction-related effects would comply with the Urban Forestry Ordinance to the extent applicable and, with mitigation measure MM BI-14a, would ensure that the Project is

constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of Candlestick Point would not conflict with any local policies or ordinances protecting biological resources, and the impact would be less than significant.

Impact of Hunters Point Shipyard Phase II

Impact BI-21b **Implementation of the Project at HPS Phase II would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant With Mitigation)** ***[Criterion N.e]***

As discussed in the consistency analysis for local policies in the Regulatory discussion above, operation of HPS Phase II would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. Further, as discussed in Impact BI-14b, with implementation of mitigation measure MM BI-14a, the Project's construction-related effects would be consistent with the policies set forth in the City's Urban Forestry Ordinance and policies reflected in Section 143 of the Planning Code for the protection of trees. Consequently, the operation of HPS Phase II would not conflict with any local policies or ordinances protecting biological resources, and the impact would be less than significant.

Project Impacts

The impact discussion below addresses the impacts of the overall Project, which is the combined development and operation of Candlestick Point and HPS Phase II, including the Yosemite Slough bridge.

Impact BI-22: Special-Status and/or Legally Protected Species

Impact BI-22 **Implementation of the Project would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, by the CDFG, USFWS, or NMFS. (Less than Significant with Mitigation)** ***[Criterion N.a]***

The Project would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt) (refer to Table III.N-5). The Project also has the potential to affect designated critical habitat of the green sturgeon and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. In addition, Project activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the MBTA and *California Fish and Game Code*.

Implementation of ecological Project design features described in the Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) would result in multiple measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the Project design components would remove invasive species; restore, preserve, and enhance wetland, aquatic and grassland habitats; create stormwater treatment wetlands; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. For areas that cannot be avoided, the Project Applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) the impacted areas of eelgrass and monitor them for success over sequential years, thus replacing impacted habitat and increasing its abundance regionally. Residual adverse effects would be less than significant with this mitigation.

Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Potential impacts to burrowing owls would be mitigated through the conservation of lands as detailed in the *California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines*, and Project-related open space preservation. Residual adverse effects would be less than significant with this mitigation.

Impacts to foraging raptors would be beneficial due to the removal of invasive plants and improvement of existing parkland through the restoration and management of native-dominated grassland. Only 5.13 acres of the lands impacted on Candlestick Point provide non-native grassland habitat that serves as foraging habitat for raptors. In addition, the Project would mitigate impacts to 43 acres of non-native grassland that provides raptor foraging habitat on HPS Phase II by restoring an equivalent amount of higher-quality native-dominated grassland specifically managed for grassland-associated species (see mitigation measure MM BI-7b). These areas would provide high-quality foraging habitat, and a net increase in the quality of raptor foraging habitat would result.

Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring. Residual adverse effects would be less than significant with this mitigation.

Development of the Project would require in-water work associated with the shoreline treatments. All work would occur in relatively shallow water areas that are unlikely to support foraging special-status fish. Still, the NMFS has considered the entire Bay in the site vicinity to be designated critical habitat for the green sturgeon and Central California Coast steelhead, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by shoreline construction activities. Compensatory mitigation for Project impacts to aquatic habitat would be provided as described by mitigation measure MM BI-4a.1, and mitigation measure MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Implementation of these measures would reduce potential adverse effects on special-status fish species to less-than-significant levels. Further, a net increase of approximately 8 acres of new aquatic habitat as a result of removal of fill and structures would more than offset the loss of open water habitat.

Impacts to western red bats would be less than significant as, although the removal of large trees could lead to disturbance and mortality of a very limited number of individuals of this species, the loss or

disturbance would not represent a substantial adverse effect as it would not substantially reduce the habitat of this species, cause its population to drop below self-sustaining levels, or reduce its range. In addition, implementation of the Project's ecological design features, as described in the Draft Parks, Open Space, and Habitat Concept Plan, would result in increased habitat for this species.

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to less-than-significant by (1) determining the distribution of oyster populations within the new marina area, and (2) preparing a modeling study of potential sediment plume generation and assessing the potential for that plume to reach oysters, and using that model to guide site-specific mitigation for sedimentation impacts to oysters that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat. Implementation of mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to the species. Residual adverse effects would be less than significant with implementation of this mitigation measure.

The Project, with implementation of the above identified mitigation measures and ecological design features, would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Potential adverse effects would be reduced to less-than-significant levels.

Impact BI-23: Sensitive Habitats

Impact BI-23 **Implementation of the Project would not have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, or regulations by the CDFG, USFWS, or NMFS. (Less than Significant with Mitigation)** ***[Criterion N.b]***

No riparian habitat occupies the Study Area and the only sensitive habitats other than wetlands and aquatic habitats (discussed in Impact BI-24) are eelgrass and areas designated as EFH.

A small area of eelgrass was reported along the north shore of the South Basin directly across from Candlestick Point and a second area was identified east of the northern end of Earl Street. Together these areas make up approximately 1.99 acres of this habitat Permanent removal of this habitat or substantial loss of productivity, such that it would no longer be ecologically functional, would result in the loss of a sensitive natural community, which would be a substantial adverse effect.

The Bay in the Project vicinity has been designated EFH for the Pacific Coast Salmon Plan, Coast Pelagics Fishery Management Plan, and Pacific Groundfish Fishery Management Plan. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered to result in changes to designated EFH. Installation of shoreline treatments its modification to EFH (i.e., installation of rock fill material to buttress existing bulkheads) would be considered a substantial adverse effect. To reduce these potential construction-related impacts to less-than-significant levels, mitigation measures MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would be implemented. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to EFH by

(1) determining the distribution of oyster populations within the new marina area, and (2) preparing a modeling study of potential sediment plume generation and assessing the potential for that plume to reach oysters, and using that model to guide site-specific mitigation for sedimentation impacts to EFH that would be designed to avoid, minimize, and if avoidance is not feasible, restore oyster habitat. Implementation of mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to EFH.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce potential Project effects on eelgrass by requiring surveys for and avoidance of this habitat. For areas than cannot be avoided, the Project Applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) the impacted areas of eelgrass and monitor them for success over a 5-year period, thus, replacing impacted habitat and increasing its abundance regionally. Residual impacts would be less than significant with implementation of this mitigation measure. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH to less-than-significant levels by (1) reducing the effects of increased contamination resulting from routine maintenance dredging by requiring that dredging occur during established work windows when sensitive fish species are less likely to be present, and (2) mandating application of BMPs to control the distribution of sediments disturbed by the dredging activities.

With implementation of the identified mitigation measures, the Project's potential adverse effects to sensitive natural communities identified in local or regional plans, policies, regulations or by the CDFG, NMFS, or USFWS would be reduced to a less–than-significant level.

Impact BI-24: Wetlands and Jurisdictional Waters

Impact BI-24 **Implementation of the Project would not have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* (including, but not limited to, marsh, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (Less than Significant with Mitigation) *[Criterion N.c]***

Table III.N-4 depicts on-site and off-site impact acreages resulting from site grading, materials laydown, facilities construction, vegetation removal, and installation of shoreline treatments for Candlestick Point, HPS Phase II, and Yosemite Slough bridge. Project implementation would permanently impact 0.74 acre of wetlands; including 0.17 acre of freshwater wetland, 0.42 acre of tidal salt marsh and 0.15 acre of non-tidal salt marsh. In addition, Project implementation would permanently impact 24.97 acres of Section 404 other waters. The Project would temporarily impact 0.01 acre of jurisdictional wetlands and 2.76 acres of Section 404 other waters. Temporary impacts are short term because, after construction, any areas disturbed would be restored to pre-construction conditions that would have equal or greater habitat functions and values. Approximately 3-4 acres of impacts to jurisdictional wetlands and other waters would result from the placement of marsh soils and other materials along portions of the shorelines of Candlestick Point and the southern edge of HPS Phase II to promote the development of a strip of tidal wetlands along the shoreline. Although such impacts are considered permanent, since they would modify these areas relative to their existing condition, these impacts are considered self-mitigating in that they would enhance habitat conditions relative to both the existing shoreline and, along the southern edge of HPS, the riprap

revetment that is expected to be constructed by the Navy following completion of remediation. Further, a net increase of approximately 8.09 acres of open water would occur as a result of the Project.

Of the 28.48 acres of total impacts to jurisdictional wetlands and other waters of the US that would occur as a result of the Project, jurisdictional areas that would be completely lost (i.e., converted to non-jurisdictional habitats) total only approximately 5.26 acres. This loss of habitat would occur primarily due to construction of the abutments of the Yosemite Slough bridge, along the northern approach road to the bridge, where a freshwater wetland is located in the west-central part of the site, and where construction of new breakwaters, a floating dock, and a gangway would occur at the marina. Approximately 12 acres would result from fill placed for drydock repairs, buttressing required to support existing pier walls and bulkheads, or other shoreline improvements.

The Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately 8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS and portions of Candlestick Point is responsible for approximately 3 to 4 acres of impacts, approximately 11 to 12 acres of the total 28.48 acres of impacts to jurisdictional areas on the Project site would result from activities that would enhance ecological conditions along the shoreline.

Direct removal, placement of fill into, or hydrological interruption of federally or state-protected wetlands defined that would result in a net loss of these areas would be considered a significant impact. Conformance with the CWA (via Sections 404 and 401 certification), Section 10 of the *Rivers and Harbors Act*, BCDC permitting requirements, and the NPDES regulations would ensure, among other things, that there is no net loss of wetlands and that water quality is maintained. Mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the USACE, SFRWQCB, and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction Best Management Practices to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* would be reduced to a less-than-significant level.

Impact BI-25: Wildlife Movement

Impact BI-25 **Implementation of the Project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site. (Less than Significant with Mitigation)** ***[Criterion N.d]***

The Study Area is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Study Area.

The majority of the bird species observed in the Study Area were terrestrial species, followed by shorebirds, waterfowl, gulls and terns, and raptors (in descending order). Very few Neotropical and other long-distance migrant songbirds were recorded during the survey. However, implementation of the Project would place new residential towers and a stadium with light towers along a portion of the San Francisco Bay shoreline. The increase in strike hazards from the tall buildings would be considered a potentially significant impact to migratory birds. The lighted stadium could also affect birds migrating at night, since lighting can disorient migrating birds, although lighting from the new stadium is unlikely to result in a substantially greater effect than lighting from the existing stadium on Candlestick Point.

With respect to aquatic species, the Project does not contain any substantial migratory fish pathways such as anadromous fish streams, although migratory fish do move through the open water and, possibly, into Yosemite Slough as they do throughout all of the San Francisco Bay estuary. The Project would not substantially interrupt any fish movements that currently occur. However, construction of breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact them such that productivity and survival of these habitats would be substantially reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be considered a significant impact due to the ecological importance of these habitats to aquatic species. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass by requiring survevs for and avoidance of this habitat. For areas than cannot be avoided, the applicant would implement a comprehensive eelgrass mitigation plan that would replace at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) for impacted areas of eelgrass and monitor them for success over sequential years; thus, replacing impacted habitat and increasing its abundance regionally. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers and design measures to make the exteriors of buildings more readily visible to birds.

With implementation of the identified mitigation measures, impacts of the Project would be reduced to a less-than-significant level as the Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact BI-26: Local Plans and Policies

Impact BI-26 **Implementation of the Project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation)*[Criterion N.e]***

As discussed previously, the Project would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*. However, construction activities associated with the Project could result in disturbance or loss of trees within DPW jurisdiction. These trees would be subject to the requirements of the *Public Works Code*, which specifies a process for gaining approval to remove trees, and requires the protection of trees during construction activities. Trees approved for removal must be replaced in accordance with DPW requirements. Compliance with the City's Street Tree Ordinance will reduce impacts to trees within DPW jurisdiction to a less-than-significant level.

The removal of trees located outside of DPW jurisdiction is not subject to regulation by the *Public Works Code*. However, the removal of large numbers of trees, particularly trees that meet the size definition of significant trees, without replacement of trees, could result in conflicts with policies articulated in the City's Urban Forestry Ordinance. The ordinance identifies trees as important to the urban environment because they improve air quality and wildlife habitat, contribute to psychological well-being and the aesthetic environment, and decrease noise. The City's *Planning Code* Section 143 embodies similar policies by requiring the planting of certain quantities of street trees when constructing new development in certain areas of the City. The Planning Code does not automatically apply in redevelopment areas, so the development that does not include planting of street trees would conflict with the policy goals of Section 143.

Mitigation measure MM BI-14a would encourage the preservation of street trees and trees that are large enough to meet the size specification of significant trees in the *Public Works Code*, and would require the replacement of large trees that are removed. Further, it would require the planting of street trees consistent with the intent of the *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees at the Project site and in the community. The planting of an estimated 10,000 net new trees would increase the number of trees in the Study Area considerably, increase canopy cover, and promote a healthy and sustainable urban forest. With implementation of mitigation measures MM BI-14a and MM BI-7b, the Project would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, and impacts would be less than significant.

The Draft Parks, Open Space, and Habitat Concept Plan (required by mitigation measure MM BI-7b) includes the planting of an estimated 10,000 net new trees at the Project site and in the community, avoids removal of native trees where possible, and establishes new parkland and open space that would include a predominance of native species. Consequently, the Project would not conflict with any local policies or ordinances protecting biological resources, and overall impacts of the Project are expected to be beneficial.

Cumulative Impacts

The geographic context for the analysis of cumulative impacts to biological resources varies, depending on the specific threshold being analyzed. The appropriate context is described for each subsection. The past and present development is generally described in the Setting section of this chapter but may also include existing development around the shoreline of the San Francisco Bay, as described in the applicable

geographic context for each criterion (refer to discussion below). Reasonably foreseeable development would include those cumulative projects that could be developed in the specified geographic area, as well as planned and in-process wetland restoration plans within the Bay area.[858] The cumulative analysis in this section is grouped by Criteria N.a through N.e identified earlier in this chapter. Criteria N.a and N.b are analyzed together. Criteria N.f and N.e. are not analyzed, as the Project would have no impact on any Habitat Conservation Plan and a beneficial impact to local plans and policies.

Effects on Candidate, Sensitive, or Special-Status Species, Riparian Habitat. or other Sensitive Natural Communities (Criteria N.a. and N.b)

The geographic context for the cumulative analysis of effects on sensitive species and sensitive natural communities is the San Francisco Bay shoreline (Region), defined north to south by the land mass and by the Carquinez Bridge on the east where I-80 crosses the Sacramento-San Joaquin Rivers at Vallejo, upstream of San Pablo Bay, and the Golden Gate Bridge on the west. This regional context contains some or all of the species and habitats identified in the Study Area. Past and present development is described in the Setting section of this chapter, along with other existing development on or adjacent to the Bay shoreline. Reasonably foreseeable development would consist of projects proposed or under construction along the shoreline of the San Francisco Bay that could affect the identified species, habitat, or sensitive natural community.

In general, cumulative projects within the Bay would include, but not be limited to new development, marinas, shoreline protection projects, flood protection projects in light of anticipated sea level rise, transportation projects, and restoration projects. These projects could involve removal and/or modification of areas that have the potential to contain special-status species and sensitive natural communities (wetlands are discussed in a separate impacts statement below). As development in the Region continues, habitat for and individuals of sensitive wildlife species native to the Region, including those species listed under federal and state ESAs and those individuals identified by state and federal resources agencies as species of concern, fully protected, or sensitive, would be lost through conversion of habitat to urbanized environment. Although more mobile species might be able to survive these changes in their environment by moving to new areas, less mobile species could simply be locally extirpated. With continued conversion of natural habitat to human use, the availability and accessibility of remaining natural habitats in this ecosystem would dwindle and those remaining natural areas may not able to support additional plant or animal populations above their current carrying capacities. Thus, the conversion of plant and wildlife habitat on a Regional level would, therefore, result in a significant regional cumulative impact on special-status species and their habitats.

The terrestrial habitats within the Project site are of low quality to terrestrial wildlife species, consisting of urbanized areas, non-native annual grassland, and landscaped areas/ornamental plants. However, some areas of moderate to high-quality habitat such as salt marsh, mud flats, and seasonal freshwater wetland, which could support special-status species, would also be impacted. The Project would also affect designated critical habitat for green sturgeon and Central California Coast steelhead, and could possibly affect individuals of these and other listed fish species. Thus, the Project could directly or indirectly impact

[858] South Bay Salt Pond Restoration Project Final Environmental Impact Statement/Environmental Impact Report. Report December 2007.

threatened and/or endangered species. Lastly, Project activities could occur within habitats of locally rare or sensitive species such as Pacific herring spawning habitat, eelgrass, Olympia oyster beds, and areas designated as EFH. Consequently, without mitigation the Project would contribute to a loss of regional biological resources through the incremental conversion of habitat for special-status species to human use.

The Project may be required to participate in mitigation plans approved by state and federal resource agencies (i.e., for green sturgeon, Central California Coast steelhead and possibly Chinook salmon and longfin smelt), which would replace lost habitat and preserve contiguous areas of habitat for these species. The Project would also implement ecological design features and mitigation measures specifically designed to avoid, reduce, or mitigate impacts to special-status/sensitive species and their habitat and reduce the Project's contribution to the cumulative loss of these species and their habitats.

Implementation of the two ecological Project design features, as described in the Draft Parks, Open Space, and Habitat Concept Plan required by mitigation measure MM BI-7b, would result in multiple measures to avoid, limit, and mitigate impacts to special-status and legally protected species. Mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce the effects on wetlands and aquatic habitats.

Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat and replacing, at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre), the impacted areas of eelgrass that cannot be avoided. Mitigation measures MM BI-6a.1 MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Potential impacts to burrowing owls would be mitigated through the conservation of lands as detailed in the *California Burrowing Owl Consortium's April 1995 Burrowing Owl Survey Protocol and Mitigation Guidelines*, and Project-related open space preservation. Impacts to foraging raptors would be beneficial due to the Project's ecological enhancements as described in the Draft Parks, Open Space, and Habitat Concept Plan (i.e., removal of invasive plants and improvement of existing parkland through the restoration and management of native-dominated grasslands), and the requirements specified in mitigation measure MM BI-7b. Only 5.13 acres of the lands impacted on Candlestick Point provide non-native grassland habitat that serves as foraging habitat for raptors. In addition, the Project would mitigate impacts to 43 acres of non-native grassland that provides raptor foraging habitat on HPS Phase II by restoring an equivalent amount of higher-quality native-dominated grassland specifically managed for grassland-associated species. These areas would represent high-quality foraging habitat and would result in a net increase in the quality of raptor foraging habitat. The Project would impact designated green sturgeon and Central California Coast steelhead critical habitat. However, compensatory mitigation for impacts to aquatic habitat, which include habitat used by green sturgeon and Central California Coast steelhead, would be provided as described by mitigation measure MM BI-4a.1, mitigating impacts to proposed green sturgeon critical habitat and designated Central California Coast steelhead to less-than-significant levels. In addition, the Project would create approximately 8 acres of new aquatic habitat throughout the removal of structures and fill from aquatic habitats in the Study Area. The Bay in the Project vicinity has been designated EFH for the Pacific Coast Salmon Plan, Coast Pelagics Fishery Management Plan, and Pacific Groundfish Fishery Management Plan. Installation of shoreline treatments that require modification of the substrate within the Bay would be considered a substantial adverse effect on designated EFH. Any loss of

EFH that would result from construction activities would be mitigated via the compensatory mitigation for impacts to jurisdictional waters (mitigation measure MM BI-4a.1), and mitigation measures MM BI-4a.2, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would also reduce or minimize potential adverse effects to EFH.

Consequently, with implementation of the proposed mitigation and ecological Project components the Project would mitigate any contributions to significant cumulative impact to candidate, sensitive, or special-status species, riparian habitat, or other sensitive natural communities. The Project would thus not make a cumulatively considerable contribution to a regionally significant cumulative impact.

Effects on Federally Protected Wetlands and Jurisdictional Waters (Criterion N.c)

The geographic context for the cumulative analysis of effects on wetlands or navigable waters is the San Francisco Bay shoreline and its adjacent wetlands, defined north to south by the land mass and by the Carquinez Bridge on the east where I-80 crosses the Sacramento-San Joaquin Rivers at Vallejo, upstream of San Pablo Bay, and the Golden Gate Bridge on the west. Past and present development is described in the Setting section of this chapter, along with other existing development on or adjacent to the Bay shoreline. Reasonably foreseeable development would consist of projects proposed or under construction

- along the shoreline of the San Francisco Bay, including the Yosemite Slough Restoration Project, that could affect federally protected wetlands or jurisdictional waters, either adversely (i.e., development projects) or beneficially (i.e., restoration projects). Permanent impacts are those that would remove wetlands or jurisdictional waters and not replace them in the exact same location. Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition.

More than 90 percent of historic tidal wetlands in the Bay Area have been lost to diking, draining, and filling.[859] The South Bay supports some of the most important habitat remaining in the entire Bay Area for a number of wildlife species, in spite of the highly urbanized surrounding areas and the dramatic alteration of the Bay itself for shipping, salt production, and urban development.[860] Wetland and jurisdictional waters restoration projects within the Bay area extensive, with approximately 40,000 acres of wetlands are either in progress or planned.[861] Although these restoration projects are attempting to reduce the cumulative loss of these habitats within the Region, the large historical loss of these areas has resulted in a cumulatively significant loss of wetlands and jurisdictional waters within the Region.

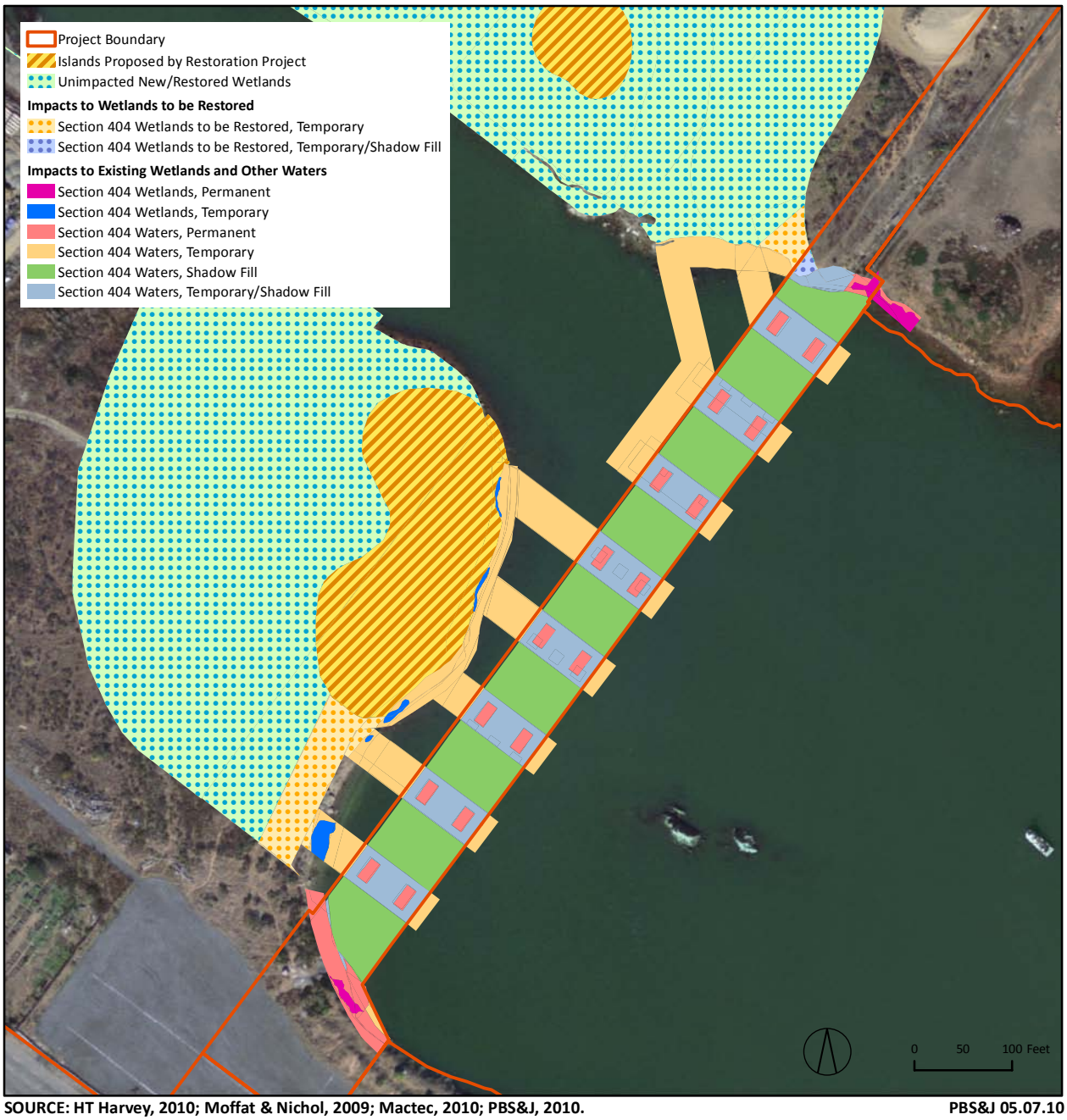
- As detailed in Table III.N-4, the Project would permanently impact 0.74 acre of wetlands and 24.97 acres of Section 404 other waters. The Project may also permanently impact 0.0992 acre and temporarily impact 0.1532 acre of a proposed Navy wetland mitigation site (refer to Figure III.N-6), if the mitigation site is constructed prior to construction of the Yosemite Slough bridge and its approaches. Temporary Project impacts would occur to 0.01 acre of wetlands and 2.76 acres of Section 404 other waters. Consequently,

[859] Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. US Environmental Protection Agency, San Francisco, California/San Francisco Bay Regional Water Quality Control Board, Oakland, California.
[860] Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. US Environmental Protection Agency, San Francisco, California/San Francisco Bay Regional Water Quality Control Board, Oakland, California.
[861] South Bay Salt Pond Restoration Project Final Environmental Impact Statement/Report. December 2007.

without mitigation of these impacts and compliance with regulations governing wetlands and jurisdictional waters, the Project would contribute to loss of wetlands and jurisdictional waters within the Region.

However, the Project also includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-gunning pier and edges of bulkheads along much of the eastern part of HPS Phase II would be removed to create new open-water habitat. Although these areas are considered permanently impacted for the purposes of this impact assessment, since some fill would be placed along the new shoreline of these bulkheads for stabilization purposes, removal of structures and fill would restore approximately 8 acres of aquatic habitat. Considering that marsh restoration along the southern edge of HPS and portions of Candlestick Point is responsible for approximately 3 to 4 acres of impacts, approximately 11 to 12 acres of the total 28.48 acres of impacts to jurisdictional areas on the Project site would result from activities that would enhance ecological conditions along the shoreline.

- In response to public concerns, additional impacts to future wetland and aquatic habitat in consideration of the Yosemite Slough Restoration Project have been quantified. If the Restoration Project is implemented before the Yosemite Slough bridge is constructed, then the bridge would impact not only existing wetlands, aquatic habitats, and mud flats, but also sensitive habitats that have been restored by the Yosemite Slough Restoration Project. Based on the final Phase I Restoration Plan (on the north side of Yosemite Slough) provided by WRA, Inc. (the firm that designed the restoration plans) on 19 January 2010 and 50 percent plans for Phase II of the Restoration Plan (on the south side of Yosemite Slough) provided by WRA on 4 February 2010, additional impacts to sensitive habitats were calculated and are illustrated by Figure III.N-7 (Impacts to Wetlands and Other Waters after Yosemite Slough Wetland Restoration). Bridge construction access would result in temporary impacts to 0.21 acre of new vegetated tidal marsh that is proposed as part of the Yosemite Slough Restoration Project, but the CP-HPS Project would result in no permanent fill of new/restored wetland, aquatic, or mud flat habitat. Further, if the Restoration Project is implemented prior to bridge construction, shoreline improvements that would otherwise have been constructed to extend along the southern Yosemite Slough shoreline will not be necessary. Therefore, 0.03 acre of permanent impacts to wetlands and 0.19 acre of permanent impacts to Section 404 waters along the southern Yosemite Slough shoreline (off site) that were originally identified for the Project would not occur if Phase II of the Restoration Plan is implemented prior to bridge construction (though these existing jurisdictional areas would be temporarily impacted during bridge construction). Temporary impacts would be mitigated through implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, as required by the Project. Based on the plans for the restoration site provided by WRA as described above, less than 0.01 acre of wetlands that would be restored by the Restoration Project would be impacted by shading as a result of being located directly under the shadow of the bridge. If additional vegetated wetlands are proposed within the bridge footprint as design for Phase II of the Restoration Plan proceeds, such that additional shading impacts to vegetated wetlands would occur, and if such wetlands are constructed prior to construction of the bridge, mitigation for such impacts will be provided by the CP HPS Project at a 1:1 ratio as described above.



SOURCE: HT Harvey, 2010; Moffat & Nichol, 2009; Mactec, 2010; PBS&J, 2010. **PBS&J 05.07.10**

FIGURE III.N-7 Candlestick Point - Hunters Point Shipyard Phase II EIR

IMPACTS TO WETLANDS AND OTHER WATERS AFTER YOSEMITE SLOUGH WETLAND RESTORATION

Any alterations of, or discharges into, waters of the United States, including Section 404 wetlands must be in conformance with the CWA via Section 404 permitting and Section 401 certification prior to any grading or construction that may impact jurisdictional area(s), as appropriate. Additionally, a SAA per Section 1600 of the *California Fish and Game Code* would be required for removal of any CDFG-jurisdictional areas, if present. Also, runoff produced during and after construction is subject to NPDES and local water quality and runoff standards. Compensation for impacts to wetlands and jurisdictional waters are developed as a part of the permitting process with the USACE, or for non-USACE-jurisdictional wetlands, during permitting through the SFRWQCB, BCDC, and/or CDFG. The exact mitigation ratio is variable, and would be based on the type and value of the wetlands or jurisdictional waters affected, and would be established during the permitting process; however, at a minimum, compensation would result in compliance with the state[862] and federal[863] "no net loss of wetlands" policies, resulting in a minimum 1:1 mitigation ratio. Therefore, minimizing impacts to jurisdictional wetlands and other waters; compensating for impacts to these habitats; securing a SAA from the CDFG (if applicable) and 404 and 401 permits under the CWA; and compliance with the federal and state "no net loss of wetlands" policy would protect the hydrology and ecology of the wetlands and jurisdictional waters within the Project site and the Bay and its adjacent wetlands. Impacts from the Project to these habitats would thus be fully compensated. Therefore, because no long-term net loss of wetland resources would be attributable to the Project, development of the Project would not make a cumulatively considerable contribution to the regionally significant cumulative impact.

Interfere Substantially with Movement of Native Fish or Wildlife Species or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of a Native Wildlife Nursery Site (Criterion N.d)

The geographic context for the analysis of cumulative impacts on movement of native fish or wildlife species is the San Francisco Bay, both the aquatic portion and adjacent lands, which represents an area of possible connectivity or relationship in terms of wildlife movement. This area includes the shoreline and extends out into the Bay to include any area of in-water construction. The past and present development is described in the Setting section of this chapter, representing the baseline conditions for the evaluation of cumulative impacts. Reasonably foreseeable development would be those cumulative projects that could be developed in the specified geographic area.

Development over the past 150 years has encroached upon and displaced biological resources throughout the City of San Francisco and the areas surrounding the Bay. The conversion of grassland, oak woodland, riparian woodland, riverine, wetland, and other native habitats to urban and suburban development has not only resulted in considerable habitat loss, but has resulted in habitat fragmentation such that native non-avian wildlife species occurring in intact patches of native terrestrial habitat cannot readily access other intact terrestrial habitat patches. The lack of connectivity between native habitat patches has rendered many terrestrial species once common to those habitat patches susceptible to local extinction. In addition the conversion of the Bay's wetlands, eelgrass, and other aquatic habitats to other habitats and/or uses has resulted in these potential nursery sites being no longer available to the species that would have historically utilized them. Consequently, the conversion of open areas, both terrestrial and aquatic, on a Regional level

[862] http://ceres.ca.gov/wetlands/policies/governor.html.
[863] http://www.fws.gov/policy/660fw1.html.

as a result of cumulative development would result in a regionally significant cumulative impact on wildlife movement corridors and nursery sites.

Wildlife Movement

The Study Area does not include any regional wildlife corridor or migratory pathways. The site is surrounded by open water and urban development and contains no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways. There would be no impact to regional terrestrial (non-avian) wildlife movement. The Project would be located along the Pacific Flyway for migratory birds. Migrating birds, such as songbirds, can be affected by human-built structures because of their propensity to migrate at night, their low flight altitudes, and their tendency to be disoriented by artificial light, making them vulnerable to collision with obstructions. This is a potentially significant cumulative impact. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the Project's effects of operational activities related to tall structures and increased lighting to birds to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operation methods to reduce the effects of artificial lighting; making the structure, especially the glass surfaces, more visible from the outside with the use of external window coverings; and the creation of non-reflective or interference zones on or inside the glass. By implementing these measures, the design of towers that would be constructed in the Project area would be more "bird-friendly", thus resulting in less risk of avian collisions, than the numerous tall buildings that have been constructed in the region that were not designed and/or are not operated with minimizing avian collision risk in mind. Consequently, implementation of the Project would not interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors and the Project would not make a considerable contribution to this cumulative impact.

Nursery Sites

Construction of the Project and the cumulative projects on the shoreline or in-water in the vicinity of eelgrass beds could remove them or indirectly impact them such that productivity and survival of these habitats would be reduced. Eelgrass communities are considered important aquatic nursery sites as they serve as a haven for numerous aquatic species. Elimination of these important nursery areas would be a significant impact if it would impede the use of the eelgrass habitat. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce potential Project effects on eelgrass by requiring surveys for and avoidance of this habitat. For areas than cannot be avoided, this habitat would be replaced at a minimum ratio of 3:1 (i.e., 3 new acres of eelgrass to 1 removed acre) thus, replacing impacted habitat. Consequently, implementation of the Project would not impede the use of native wildlife nursery sites and the Project would not make a considerable contribution to this cumulative impact.

Overall, the Project's contribution to the cumulative impact on wildlife movement and wildlife nursery sites would be reduced to less than considerable by implementation of the above- mentioned mitigation measures. The Project's cumulative impact would, therefore, be less than significant.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
			PLANTS	
Adobe sanicle	*Sanicula maritima*	none/SR/1B.1	Chaparral, coastal prairie, meadows and seeps, and valley and foothill grasslands in association with clay or serpentine soils. 98–787 feet (30–240 meters); blooms February–May	**Not Likely.** Suitable habitat for this species occurs in the Study Area. However, there are no recorded occurrences of this species within 5 miles of the Study Area, and none were observed during rare plant surveys of suitable habitat in 2007 and 2008 by PBS&J.
Alkali milk-vetch	*Astragalus tener* var. *tener*	none/none/1B.2	Playas, valley and foothill grassland with adobe clay, and vernal pools with alkaline soils. 0–2051 feet (0–625 meters); blooms May–September.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area.
Arcuate bush-mallow	*Malacothamnus arcuatus*	none/none/1B.2	Chaparral and cismontane woodland. 82–295 feet (25–90 meters); blooms April–September.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area.
Beach layia	*Layia carnosa*	FE/SE/1B.1	Coastal dunes and coastal scrub with sandy soils. 0–197 feet (0–60 meters); blooms March–July.	**Not Likely.** Coastal scrub does not occur in the Study Area. This species was not observed during surveys conducted by PBS&J in 2007 and 2008.
Bent-flowered fiddleneck	*Amsinckia lunaris*	none/none/1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland habitats. 10–1,640 feet (3– 500 meters); blooms March–June	**Not Likely.** Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of *Amsinckia* were observed during floristic surveys conducted in 2005 by CNPS[864] and in 2007 and 2008 by PBS&J.
Big-scale balsamroot	*Balsamorhiza macrolepis* var. *macrolepis*	none/none/1B.2	Occurs in chaparral, cismontane woodland, and valley and foothill grassland, sometimes in serpentine soil substrates at elevations ranging from 295–4,593 feet (90–1,400 meters); blooms March–June.	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Balsamorhiza* were observed during floristic surveys conducted in 2005 by CNPS[865] and in 2007 and 2008 by PBS&J.
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	none/none/1B.1	Coastal dunes and coastal scrub. 7–656 feet (2–200 meters); blooms April–July.	**Not Likely.** Coastal scrub does not occur in the Study Area. There are no recorded occurrences of this species within 5 miles of the Study Area.
Bristly sedge	*Carex comosa*	none/none/2.1	Coastal prairie, marshes and swamps (along lake margins), and valley and foothill grassland. 0–2,051 feet (0–625 meters); blooms May–September.	**Not Likely.** Marsh habitat in the Study Area has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007.[866]

[864] California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.
[865] Ibid.
[866] Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
California seablite	*Suaeda californica*	FE/none/1B.1	Marshes and swamps with coastal salt marsh. 0–49 feet (0–15 meters); blooms July–October.	**Not Likely.** Marsh habitat in the Study Area has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007.[867]
Coastal triquetrella	*Triquetrella californica*	none/none/1B.2	A moss that occurs in coastal bluff scrub and coastal scrub. 33–328 feet (10–100 meters).	**Not Likely.** Coastal scrub does not occur in the Study Area.
Compact cobwebby thistle	*Cirsium occidentale* var. *compactum*	none/none/1B.2	Chaparral, coastal dunes, coastal prairie, and costal scrub. 16–492 feet (5–150 meters); blooms April–June.	**Not Likely.** Coastal scrub does not occur in the Study Area. No native species of *Cirsium* were observed during floristic surveys conducted in 2005 by CNPS[868] and in 2007 and 2008 by PBS&J.
Crystal Springs lessingia	*Lessingia arachnoidea*	none/none/1B.2	Cismontane woodland, coastal scrub, and valley and foothill grassland habitats, in association with serpentinite soils along roadsides. 197–656 feet (60–200 meters); blooms July–October	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Lessingia* were observed during floristic surveys conducted by CNPS[869] and PBS&J in 2007 and 2008.
Diablo helianthella	*Helianthella castanea*	none/none/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. 197–4,265 feet (60–1,300 meters); blooms March–June.	**Not Likely.** Chaparral or oak woodland absent in Study Area.
Fountain thistle	*Cirsium fontinale* var. *fontinale*	FE/SE/1B.1	Openings in chaparral habitats; valley and foothill grassland habitats in association with serpentinite seeps. 295–574 feet (90–175 meters); blooms June–October	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of *Cirsium* were observed during floristic surveys conducted by CNPS[870] and PBS&J in 2007 and 2008.
Fragrant fritillary	*Fritillaria liliacea*	none/none/1B.2	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland habitats often in association with serpentinite soils. 10–1,345 feet (3–410 meters); blooms February–April	**Not Likely.** Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of *Fritillaria* were observed during floristic surveys conducted by CNPS[871] and PBS&J in 2007 and 2008.

867 Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.
868 California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.
869 Ibid.
870 Ibid.
871 Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Franciscan manzanita	*Arctostaphylos hookeri* ssp. *franciscana*	none/none/1A	Coastal scrub with serpentinite soil substrates. 197–984 feet (60–300 meters); blooms February–April.	**Not Likely.** Serpentinite soil substrates do not occur within Study Area. No recorded occurrences of this species within 5 miles of the Study Area. No species of *Arctostaphylos* were observed during surveys conducted by Caltrans in 2007[872] and PBS&J in 2007 and 2008.
Franciscan onion	*Allium peninsulare* var. *franciscanum*	SLC/none/1B.2	Clay and serpentine soils on dry hillsides in woodlands and valley and foothill grasslands 170–984 feet (52–300 meters); blooms May–June.	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Allium* were observed during floristic surveys conducted by CNPS[873] and PBS&J in 2007 and 2008.
Franciscan thistle	*Cirsium andrewsii*	none/none/1B.2	Broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub habitats, often in association with serpentinite soils. 0–492 feet (0–150 meters); blooms March–July	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of *Cirsium* were observed during floristic surveys conducted by CNPS[874] and PBS&J in 2007 and 2008.
Hillsborough chocolate lily	*Fritillaria biflora* var. *ineziana*	none/none/1B.1	Cismontane woodland and valley and foothill grassland habitats in association with serpentinite soils. 492 feet (150 meters); blooms March–April	**Not Likely.** Known only from the Hillsborough area. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no native species of *Fritillaria* were observed during floristic surveys conducted by CNPS[875] and PBS&J in 2007 and 2008.
Kellogg's horkelia	*Horkelia cuneata* ssp. *sericea*	none/none/1B.1	Closed-cone coniferous forest, chaparral, coastal dunes, and coastal scrub with sandy or gravelly openings. 33–656 feet (10–200 meters); blooms April–September.	**Not Likely.** Coastal scrub does not occur in the Study Area.
Marin western flax	*Hesperolinon congestum*	FT/ST/1B.1	Chaparral and valley and foothill grassland habitats in association with serpentinite soils. 16–1214 feet (5–370 meters); blooms April–July	**Not Likely.** Although there are recorded occurrences of this species within 5 miles of the Study Area, no species of *Hesperolinon* were observed during floristic surveys conducted by CNPS and PBS&J in 2007 and 2008.

[872] Jones and Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.
[873] California Native Plant Society (CNPS), Yerba Buena Chapter, Electronic plant list; Hunters Point Serpentine Hillside, R. Hunter and J. Sigg, 2005.
[874] Ibid.
[875] Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Montara manzanita	*Arctostaphylos montaraensis*	none/none/1B.2	Chaparral and coastal scrub. 492–1,640 feet (150–500 meters); blooms January–March.	**Not Likely.** Coastal scrub does not occur in the Study Area. No species of *Arctostphylos* were observed during surveys conducted by Caltrans in 2007[876] and PBS&J in 2007 and 2008.
Most beautiful jewel-flower	*Streptanthus albidus* ssp. *permoenus*	none/none/1B.2	Chaparral, cismontane woodland, valley and foothill grasslands, often on serpentine soils. 361–3,281 feet (110–1,000 meters); blooms April–June.	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Streptanthus* were observed during floristic surveys conducted by CNPS and PBS&J in 2007 and 2008.
Pacific manzanita	*Arctostaphylos pacifica*	none/SE/1B.2	Chaparral and coastal scrub. 1,083 feet (330 meters); blooms February–April.	**Not Likely.** Coastal scrub does not occur in the Study Area. Species of *Arctostaphylos* not identified during surveys.
Point Reyes bird's-beak	*Cordylanthus maritimus* ssp. *palustris*	none/none/1B.2	Coastal salt marsh. 0–33 feet (0–10 meters); blooms June–October.	**Not Likely.** Marsh habitat in the Study Area is of marginal quality and has been highly degraded. This species was not observed during surveys conducted by Caltrans in 2007.[877] Observed in adjacent off-site locations to the Yosemite Slough area according to the Yosemite Slough IS/MND.[878] Was not observed in the Yosemite Slough area during 2005 surveys conducted by LSA.
Presidio clarkia	*Clarkia franciscana*	FE/SE/1B.1	Occurs in coastal scrub and valley and foothill grassland, often on serpentine soils. 82–1,099 feet (25–335 meters); blooms May–July	**Not Likely.** Known from fewer than five occurrences. The closest two known populations are in the San Francisco Presidio approximately 6 miles northwest. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Clarkia* were observed during floristic surveys conducted by CNPS[879] and PBS&J in 2007 and 2008.
Presidio manzanita	*Arctostaphylos hookeri ssp. ravenii*	FE/SE/1B.1	Chaparral, coastal prairie, and coastal scrub with serpentinite outcrops. 148–705 feet (45–215 meters); blooms February–March.	**Not Likely.** Serpentinite soil substrates do not occur within Study Area; however, there are no recorded occurrences of this species within 5 miles of the Study Area. Species of *Arctostaphylos* not identified during surveys.

[876] Jones & Stokes, Natural Environmental Study Report for the Bayview Transportation Improvements Project, June 2009.
[877] Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.
[878] California State Parks Foundation, Draft Initial Study –Mitigated Negative Declaration for the Candlestick Point State Recreation Area Yosemite Slough Restoration Project, December 2005.
[879] California Native Plant Society, California Native Plant Society, Yerba Buena Chapter, Electronic plant list; R. Hunter and J. Sigg, 2005.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Robust spineflower	*Chorizanthe robusta* var. *robusta*	FE/none/1B.1	Chaparral, cismontane woodlands (in openings), coastal dunes, coastal scrub with sandy or gravelly soil. 10–984 feet (3–300) meters; blooms April–September.	**Not Likely.** Coastal dunes are absent from the Study Area. Remnant dunes in the Study Area are disturbed habitat. This species was not observed during surveys conducted by PBS&J in 2007 and 2008.
Rose leptosiphon	*Leptosiphon rosaceus*	none/none/1B.1	Coastal bluff scrub. 0–328 feet (0–100 meters); blooms April–July.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area.
San Bruno Mountain manzanita	*Arctostaphylos imbricata*	none/SE/1B.1	Chaparral and coastal scrub with rocky substrate. 902–1,214 feet (275–370 meters); blooms February–May.	**Not Likely.** Coastal scrub does not occur in the Study Area. Species of *Arctostaphylos* not identified during surveys.
San Francisco Bay spineflower	*Chorizanthe cuspidate* var. *cuspidata*	none/none/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub with sandy soils. 10–705 feet (3–215 meters); blooms April–July (uncommon in August).	**Not Likely.** Coastal scrub does not occur in the Study Area.
San Francisco campion	*Silene vercunda* ssp. *verecunda*	none/none/1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland with sandy soil. 98–2,116 feet (30–645 meters); blooms March–June (uncommon in August).	**Not Likely.** Coastal scrub does not occur in the Study Area.
San Francisco Collinsia	*Collinsia multicolor*	none/none/1B.2	Closed-cone coniferous forest and coastal scrub (sometimes with serpentinite soil). 98–820 feet (30–250 meters); Blooms March–May.	**Not Likely.** Coastal scrub does not occur in the Study Area.
San Francisco gumplant	*Grindelia hirsutula* var. *maritima*	none/none/1B.2	Coastal bluff scrub, coastal scrub, and valley and foothill grassland habitats in association with sandy or serpentinite soils. 49–1,312 feet (15–400 meters); blooms June–September	**Not Likely.** Although there are a number of recorded occurrences of this species within 5 miles of the Study Area, this species was not observed during floristic surveys conducted by CNPS[880] and PBS&J in 2007 and 2008.
San Francisco Lessingia	*Lessingia germanorum*	FE/SE/1B.1	Coastal scrub (remnant dunes). 82–295 feet (25–90 meters); blooms July–November (uncommon in June).	**Not Likely.** Coastal scrub does not occur in the Study Area. This species was not observed in sandy soil areas during surveys; no species of *Lessingia* were observed during floristic surveys conducted by CNPS[881] and PBS&J in 2007 and 2008.

[880] Ibid.
[881] Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
San Francisco owl's-clover	*Triphysaria floribunda*	none/none/1B.2	Coastal prairie, coastal scrub, and valley and foothill grassland habitats in association with serpentinite soils. 33–525 feet (10–60 meters); blooms April–June	**Not Likely.** Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of *Triphysaria* has been observed during floristic surveys conducted by CNPS[882] and PBS&J in 2007 and 2008.
San Francisco popcornflower	*Plagiobothrys diffusus*	None/SE/ 1B.1	Occurs in coastal prairie and valley and foothill grassland. 197–1,181 feet (60–360 meters); blooms March–June.	**Not Likely.** Known from fewer than ten occurrences. Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Plagiobothrys* were observed during floristic surveys conducted by CNPS[883] and PBS&J in 2007 and 2008.
SanMateo thorn-mint	*Acanthomintha duttonii*	FE/SE/1B.1	Chaparral and valley and foothill grassland habitats, often on serpentinite soil substrates. 164–984 feet (50–300 meters); blooms April–June	**Not Likely.** Serpentinite soil substrates do not occur within Study Area, however there are no recorded occurrences of this species within 5 miles of the Study Area; species of *Acanthomintha* were not observed during floristic surveys conducted by CNPS[884] and PBS&J in 2007 and 2008.
Santa Cruz microseris	*Stebbinsoseris decipiens*	none/none/1B.2	Openings in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grasslands, sometimes on serpentine soils. 33–1,640 feet (10–500 meters); blooms April–May.	**Not Likely.** Although potentially suitable habitat and soil substrates are present, there are no recorded occurrences of this species within 5 miles of the Study Area; no species of *Stebbinsoseris* were observed during floristic surveys conducted by CNPS[885] and PBS&J in 2007 and 2008.
Short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	none/none/2.2	Coastal bluff with sandy soil and coastal dunes. 0–705 feet (0–215 meters); blooms March–June.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE/SE/List 1B.1	Occurs in cismontane woodland and valley and foothill grassland, often in serpentinite. 115–2034 feet (35–620 meters); blooms March–May	**Not Likely.** Although there is one recorded occurrence of this species within 5 miles of the Study Area, no species of *Pentachaeta* were observed during floristic surveys conducted by CNPS[886] and PBS&J in 2007 and 2008.

[882] Ibid.
[883] Ibid.
[884] Ibid.
[885] Ibid.
[886] Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
			SENSITIVE NATURAL COMMUNITIES	
Coastal brackish marsh (salt marsh)		CDFG Sensitive Habitat		**Known.** The Study Area supports representative assemblages of plant species associated with this community type. Degraded occurrences of this sensitive natural community are present along the southern portion of HPS Phase II site, along Yosemite Slough, and patches along the Candlestick Point shoreline.[887]
			INVERTEBRATES	
Bay checkerspot butterfly	*Euphydryas editha bayensis*	FT/none/none Critical habitat	All habitats for the bay checkerspot are on shallow, serpentine-derived, or similar soils. These soils support the plants on which the caterpillars (larvae) feed the primary larval host plant is dwarf plantain (*Plantago erecta*). In many years, the plantain dries up and the larvae transfer to a second host plant, Indian paintbrush, or purple owl's clover (*Castilleja exserta* spp. *exerta*), which remains edible later in the season.	**Not Likely.** It is not likely that there is a sufficient population of plantain to support Bay checkerspot in the Study Area.[888] Sites that support this species provide greater topographic heterogeneity than the serpentine grassland in the Study Area. Although there are a number of recorded occurrences for this species within 5 miles of the Study Area, this species was extirpated from the closest location of historical occurrence (San Bruno Mountain) in the 1980's.
Callippe silverspot butterfly	*Speyeria callippe callippe*	FE/none/none	Occurs in grassland habitats around the northern Bay Area containing Johnny jump-up (*Viola pedunculata*), which is the larval host plant for this species.	**Not Likely.** Although there are a number of recorded occurrences within 5 miles of the Study Area, *V. pedunculata* has not been observed within the Study Area. In addition, although there are nearby occurrences, there is an insufficient population of this species' host plant within the Study Area to sustain a population of this species.[889]

[887] H.T. Harvey & Associates, Hunters Point Shipyard and Candlestick Point State Recreation Area Final Delineation of Wetlands and Other Waters, San Francisco, California, February 2009 and revised July 13, 2009 and October 2, 2009.
[888] Kobernus, P., Senior Biologist, TRA Environmental Sciences, Inc., email to PBS&J, August 30, 2007.
[889] Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Mission blue butterfly	*Plebejus* [*Icaricia*] *icarioides missionensis*	FE/none/none	The adults feed on hairy false goldenaster (*Heterotheca villosa*), blue dicks (*Dichelostemma capitatum*), and seaside buckwheat (*Eriogonum latifolium*). They do not wander far from the three species of lupine that are the larval food plant: silver lupine (*Lupinus albifrons*), summer lupine (*L. formosus*), and many-colored lupine (*L. versicolor*). Females lay eggs throughout the mating flight. The eggs are laid singly on leaves, stems, flowers, and seedpods of lupine species.	**Not Likely.** Although there are a number of recorded occurrences for this species within 5 miles of the Study Area, including one from the Bayview Hill area, the Study Area does not support a substantial stand of lupine (*Lupinus* spp.) to support this species.[890] Isolated lupine plants intermixed within ruderal vegetation was observed along the Candlestick Point area, near Yosemite Slough. One or two lupine plants were observed in this area during the May 5, 2008 survey, but this would not constitute habitat for this species.
Monarch butterfly (wintering)[891]	*Danaus plexippus*	none/none/ESHA	Occur in many open habitats including fields, meadows, weedy areas, marshes, and roadsides. Adults migrate from August to October, flying south to hibernate along the California coast and in central Mexico. During migration and wintering, butterflies roost in trees and form huge aggregations. Caterpillars feed exclusively on milkweed (*Asclepias* spp.); early in the season, adults sip nectar from dogbane (*Apocynum* spp.), lilac (*Ceanothus* spp.), red clover (*Trifolium pratense*), *Lantana* spp., and thistles (*Cirsium* spp.). In the fall adults visit composites including goldenrods (*Solidago californica*), blazing stars (*Liatris spicata*), ironweed (*Vernonia* spp.), and tickseed sunflower (*Bidens* spp.).	**Known, but Not Likely roosting.** Although individuals have been observed on the site, there is no record of monarch butterfly autumnal (i.e., temporary bivouac site) or over-wintering use of the Study Area in the CNDDB and other records, including anecdotal observations. The nearest observations of such roosts are at Fort Mason, the Presidio of San Francisco, and Stern Grove. The modification of Hunters Point and Candlestick Park would not affect those sites.[892]
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE/none/none	Occurs in grassland habitats around the northern Bay Area. The larval host plant is hookspur violet (*Viola adunca*). Adults feed on nectar from flowers including hairy gumweed, coastal sand verbena (*Abronia latifolia*), mints (or monardella) (*Monardella* spp.), bull thistle (*Cirsium vulgare*), and seaside fleabane (*Erigeron glaucus*).	**Not Likely.** There are no recorded occurrences of this species within 5 miles of the Study Area. The Study Area does not support the suitable host plants for this species.

[890] United States Fish and Wildlife Service (USFWS), Endangered and Threatened Wildlife and Plants*: Proposed Determination of Critical Habitat for Six Butterflies and Two Plants*, 42 Federal Register 7972, February 8, 1977.
[891] Wintering habitat is considered an Environmentally Sensitive Habitat Area by the California Coastal Commission.
[892] Monroe, M., Ranger, Muir Woods National Monument, telephone conversation with Todd Wong, July 16, 2008.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
San Bruno elfin butterfly	*Callophyrs* [*Incisalia*] *mossii bayensis*	FE/none/none	Endemic to the coastal mountains near San Francisco Bay. Eggs are laid in small clusters or strings on the upper or lower surface of broadleaf stonecrop (*Sedum spathulifolium*). The adult food plants have not been fully determined but Montara Mountain colonies are suspected to use Montara manzanita (*Arctostaphylos montaraensis*) and California huckleberry (*Vaccinium ovatum*).	**Not Likely.** There are a number of recorded occurrences for this species within 5 miles of the Study Area. However, the San Bruno elfin is found in the fog-belt of steep north facing slopes that receive little direct sunlight. It lives near prolific growths of the larval food plant, stonecrop, which is a low growing succulent. The Study Area does not support suitable larval and adult host plants.[893]
			MOLLUSKS	
Black abalone	*Haliotes cracherodii*	FC/none/none	Endemic to Santa Barbara Channel Islands.	**Absent.** The Study Area is outside the range of this species.
White abalone	*Haliotes sorenseni*	FE/none/none	Rocky marine subtidal (to 200 feet deep) and extreme lower intertidal (below 15 feet deep) habitats. Current population extremely depleted.	**Absent.** The Study Area is too shallow and modified to provide suitable habitat.
Olympia oyster	*Ostreola conchaphila*	none/none/CEQA	Native Olympia oysters were historically abundant in San Francisco Bay, and small populations of native oysters have been documented within the Bay. Suitable substrate includes solid surfaces to which the larvae can easily attach.	**High.** Because the larval forms of oysters are free-floating in the Bay and a large population exists south of the Study Area at Oyster Point Marina, native oysters are likely present on suitable substrate throughout the Study Area.
			FISH	
Pacific herring	*Clupea pallasi*	none/none/CEQA	Pacific herring generally enter the Bay from November through April of each year and spawn in intertidal and sub-tidal habitats.	**Known**. According to NMFS, known herring spawning areas within the Study Area include several piers and areas of shoreline both north and south of the proposed marina.
Chinook salmon –Spring-run ESU	*Oncorhynchus tshawytscha*	FT/ST/none	Central Valley streams with stable water supply, clean gravel, and good quality riparian habitat. Spawning occurs only in tributaries to the Sacramento River.	**Low.** The Study Area is outside the migratory corridor for this species. Adults migrate from the Golden Gate into the Sacramento River.
Chinook salmon –Winter-run ESU	*Oncorhynchus tshawytscha*	FE/ST/none Critical habitat	Central Valley streams with stable water supply, clean gravel, and good quality riparian habitat. Spawning occurs upstream of the Red Bluff Diversion Dam.	**Low.** The Study Area is generally outside the migratory corridor for this species. Adults migrate from the Golden Gate into the Sacramento River. Study Area is outside of designated critical habitat.

[893] Kobernus, P., Senior Biologist, TRA Environmental Sciences, Inc., email to PBS&J, August 30, 2007.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Chinook salmon –Fall/Late Fall-run ESUs	*Oncorhynchus tshawytscha*	SC/SSC/none	The most abundant Chinook in the Central Valley. Fall/Late fall-run fish spawn in streams with stable water supply, clean gravel, and good quality riparian habitat.	**Low.** The Study Area is generally outside the migratory corridor for this ESU. A population exists in the South Bay that would migrate past the Study Area on the way to and from the ocean. The origin and status of this population is unclear (refer to text).
Coho salmon—Central California ESU	*Oncorhynchus kisutch*	FE/SE/none	Spawning in accessible coastal streams, generally in areas with complex instream habitat, heavy forest cover, and high quality water. Juveniles rear in these areas for two years before migrating to the ocean.	**Absent.** This species does not currently exist in the San Francisco Bay.[894]
Delta smelt	*Hypomesus transpacificus*	FT/SE/none	Endemic to the Sacramento-San Joaquin Delta. Adults spawn in freshwater in the upper Delta. The rest of the year, they reside primarily in the interface between salt and freshwater of the Sacramento-San Joaquin Delta at salinities less than 2 parts per million.	**Absent.** The Study Area is outside the known range of this species.
Longfin smelt	*Spirinchus thaleichthys*	none/ST/none	Native to San Francisco Bay. Adults spawn in upper estuary in early winter. Larvae are dispersed by downstream flow and distribution is determined by outflow. Adults found outside the Bay in some years.	**Moderate.** Based on a 2009 status review, distribution of larval fish is determined by outflow from the Sacramento-San Joaquin River Estuary where adults spawn.[895] As they develop swimming ability, they could disperse into the Study Area. They are captured as by-catch in the Bay for bay shrimp (*Crangon franciscorum*).
Green sturgeon	*Acipenser medirostris*	FT/SSC/none Proposed Critical Habitat	Migrates through the San Francisco Bay to spawning grounds in the upper Sacramento River. Juveniles move into the estuary and likely rear in San Francisco Bay.	**High.** The species likely forages in the Bay including the area near the Study Area. The Study Area is within proposed critical habitat for this species.
Steelhead—Central California Coast DPS	*Oncorhynchus mykiss*	FT/none/none Critical habitat	Spawns in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating to the ocean.	**High.** Juveniles and adult steelhead could be found in the open waters adjacent to the Study Area as they migrate to and from streams in the San Francisco Bay. Populations are known from relatively nearby creeks on the peninsula (i.e., San Francisquito Creek). The Study Area is within designated critical habitat for this DPS.
Steelhead—Central Valley DPS	*Oncorhynchus mykiss*	FT/none/none Critical habitat	Spawns in cool, clear, well-oxygenated streams. Juveniles remain in freshwater for one or more years before migrating to the ocean.	**Low.** Even though their primary migratory pathway is into the Sacramento River, juveniles and adult steelhead could potentially be found in the Bay near the Project. The Study Area is outside of designated critical habitat for this DPS.

[894] Jones and Stokes, Biological Assessment for the Bayview Transportation Improvements Project, June 2009.
[895] California Department of Fish and Game (CDFG), *A Status Review of the Longfin Smelt (Spirinchus thaleichthys) in California, January 2009*.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Tidewater goby	*Eucyclogobius newberryi*	FE/SSC/none	Brackish water habitats along coast, fairly still but not stagnant water and high oxygen levels.	**Absent.** The shoreline of the Study Area is influenced by tidal activity. Brackish water habitat absent. Due to degradation lagoon/estuary habitat does not exist.[896]
			AMPHIBIANS	
California red-legged frog	*Rana aurora draytonii*	FT/SSC/none	Permanent and semi-permanent freshwater habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation.	**Not Likely.** Perennial freshwater habitat is absent from the Study Area. There are no CNDDB records for this species in the vicinity of the Study Area.
			REPTILES	
Green turtle	*Chelonia mydas*	FT/none/none	Shallow water with sufficient submergent vegetation. Breeds on islands often but also on mainland sandy beaches.	**Absent.** Suitable habitat for this species does not occur in the Study Area.
Leatherback turtle	*Dermochelys coriacea*	FE/none/none	Marine, open ocean often near continental shelf. Nests on sloped sandy beaches often near deep water.	**Absent.** Suitable habitat for this species does not occur in the Study Area.
Loggerhead turtle	*Caretta caretta*	FT/none/none	Open ocean up to 500 miles off shore. Nests on sandy beaches seaward of well developed dunes.	**Absent.** Suitable habitat for this species does not occur in the Study Area.
Olive (=Pacific) ridley sea turtle	*Lepidochelys olivacea*	FT/none/none	Near shore less and 15 km. bottom dwelling sea turtle, nests on sandy beaches.	**Absent.** Suitable habitat for this species does not occur in the Study Area.
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	FE/ST/FP	Inhabits ponds, streams, rivers, and reservoirs, typically with riparian or emergent vegetation. Requires upland areas for aestivation and nesting, usually within 100 yards of permanent water source.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area. There are no CNDDB records for this species in the vicinity of the Study Area.
Western pond turtle	*Actinemys marmorata*	none/SSC/none	Typically inhabit ponds, slow-moving streams and rivers, irrigation ditches, and reservoirs with abundant emergent and/or riparian vegetation.	**Not Likely.** Suitable habitat for this species does not occur in the Study Area. There are no CNDDB records for this species in the vicinity of the Study Area.
			BIRDS	
Alameda song sparrow	*Melospiza melodia pusillula*	none/SSC/none	Tidal salt marsh habitats along the edge of the Bay and streams where tidal flow effects the vegetation.	**Low.** Salt marsh along Yosemite Slough and the HPS shoreline provides marginal habitat for this species due to its limited extent. Song sparrows were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were Alameda song sparrows.

[896] Jones and Stokes, *Biological Assessment for the Bayview Transportation Improvements Project*, June 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[a] Fed/ CA/ other	Habitat and Seasonal Distribution in California	Likelihood of Occurrence Within the Study Area
American peregrine falcon (nesting)	*Falco pergrinus anatum*	Delisted/SE (proposed delisted)/FP	Frequents bodies of water in open areas with cliffs and canyons nearby for cover and nesting. Known to nest on artificial substrates (bridges, buildings, etc)	**Known.** A pair of American Peregrine falcons was observed nesting in the Re-gunning crane on Parcel D of the HPS Phase II site. The pair has raised several young at this location.[897]
Bank swallow (nesting)	*Riparia riparia*	none/ST/none	Nests in steep sandy banks where it excavates burrows.	**Not Likely.** Although individuals have been observed in the vicinity, the Study Area does not provide suitable nesting habitat.
Barrow's goldeneye	*Bucephala islandica*	none/SSC/none	Breeds in high central & northern Sierra Nevada Mountains, near wooded mountain lakes or large streams. Nest in tree cavities, such as a deserted nest-hole of a pileated woodpecker or flicker; also use nest boxes.	**Known.** Although observed near the site during migration and winter, the Study Area does not provide suitable nesting habitat and is well outside the species' breeding range.
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	none/SSC/none	Frequents low tidally influenced habitats, adjacent to ruderal areas, moist grasslands within and just above the fog belt, and grasslands.	**Low.** Salt marsh along Yosemite Slough and the HPS shoreline provides marginal habitat for this species due to its limited extent. Savannah sparrows were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were Bryant's savannah sparrows.
Burrowing owl	*Athene cunicularia*	none/SSC/none	Found in open, dry grasslands, deserts, and ruderal areas. Requires suitable small mammal burrows.	**Known.** This species has been observed in the past on Candlestick Point and at HPS, and suitable foraging habitat is present on the site. Although suitable conditions for nesting are present, the species is not known to have nested on the site. Currently, it is either absent, or it occurs sporadically as a non-breeding visitor.
California black rail	*Laterallus jamaicensis coturniculus*	none/ST/FP	Inhabits tidal salt marshes bordering larger bays, or other freshwater and brackish marshes, at low elevations.	**Not Likely.** Small mats of pickleweed adjacent to brackish wetlands are too limited in extent and too highly disturbed to provide suitable habitat. Tidal zone is very narrow.
California brown pelican (rookery and communal roosts)	*Pelecanus occidentalis californicus*	FPD/SPD[898]/FP	Typically in littoral ocean zones, just outside the surf line; nests on offshore islands.	**Known.** This species was observed roosting on piers within the Study Area. However, suitable nesting habitat for this species does not occur in the Study Area. The Study Area is outside this species' current breeding range.

[897] Nelson, G., Facility Coordinator, Navy, field visit with PBS&J, July 8, 2008.
[898] California Department of Fish and Game (CDFG) news release: *Fish and Game Commission votes to remove California brown pelican from State Endangered Species List*. February 17, 2009.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
California clapper rail	*Rallus longirostris obsoletus*	FE/SE/FP	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickle-weed; feeds on mollusks removed from the mud in sloughs.	**Not Likely.** Suitable habitat does not occur in the Study Area. Salt marsh is highly disturbed and limited in the Study Area. Yosemite Slough is a tidal slough, but suitable habitat for the rail is absent because the existing salt marsh in Yosemite Slough is very narrow and unsuitable. The lack of tidal channels within those marshes, feeding into Yosemite Slough further reduce habitat quality.
California least tern (nesting colony)	*Sternula antillarum browni*	FE/ST/FP	Nests on sandy, upper ocean beaches, and occasionally uses mud flats; forages on adjacent surf line, estuaries, or the open ocean.	**Not Likely.** Suitable nesting habitat does not occur in the Study Area. Individuals may forage in the open water adjacent to the Study Area.
Common loon	*Gavia immer*	none/SSC/none	Nesting locations at certain large lakes & reservoirs in interior of state, primarily in northeastern plateau region. Bodies of water regularly frequented are extensive, fairly deep, and produce quantities of large fish.	**Known.** Although observed near the site during migration and winter, the Study Area does not provide suitable nesting habitat and is well outside the species' breeding range.
Harlequin duck (nesting)	*Histrionicus histrionicus*	none/SSC/none	Usually nests along shores of shallow, swift rivers with plentiful aquatic invertebrates.[899]	**Known.** This species was observed perching on the piers in the HPS Phase II site. However, the Study Area does not provide suitable nesting habitat for this species. The Study Area is outside this species' current breeding range.
Loggerhead shrike	*Lanius ludovicianus*	none/SSC/none	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. Typically nests in broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and wash.	**Known.** Non-native grasslands provide suitable foraging habitat. Loggerhead shrike has been observed by Alan Hopkins at the CPSRA.[900] Although suitable conditions for nesting are present, the species is not known to have nested on the site. Currently, it is either absent, or it occurs sporadically as a non-breeding visitor.
Marbled murrelet	*Brachyramphus marmoratus*	FT/SE/none	Mature, coastal coniferous forests for nesting; nearby coastal water for foraging; nests in conifer stands greater than 150 years old and may be found up to 35 miles inland; winters on subtidal and pelagic waters often well offshore.	**Absent.** Suitable habitat not present in the Study Area.

[899] California Department of Fish and Game (CDFG). Website: http://www.dfg.ca.gov/whdab/html/B096.html. Accessed April 6, 2005.
[900] Golden Gate Audubon Society, *Final Report Yosemite Slough Watershed Wildlife Survey 2003–2004*, prepared by LSA, July 27 2004.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
Northern harrier	*Circus cyaneus*	none/SSC/none	Coastal salt & fresh-water marsh. Nest & forage in grasslands, from salt grass in desert sink to mountain cienegas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Known.** Salt marsh and ruderal habitats provide suitable foraging habitat for this species, which has been observed by Alan Hopkins at the CPSRA.[901] However, suitable breeding habitat is absent due to the limited extent of marsh, human disturbance, and vulnerability of this ground-nesting species to predation.
San Francisco yellowthroat	*Geothlypis trichas sinuosa*	none/SSC/none	Inhabits emergent wetland habitat, and is a resident and summer visitor in the San Francisco Bay area. Nests are usually placed on or within 8 cm (3 inches) of ground; and may be positioned over water in emergent aquatic vegetation, dense shrubs, or other dense growth.	**Moderate.** Salt marsh along Yosemite Slough and the HPS shoreline provides potential habitat for this species. The existing salt marsh provides marginal habitat due to its limited extent. Common yellowthroats were observed between January 2003 and April 2004 along Yosemite Slough, however it is unknown whether these were San Francisco yellowthroats.[902]
Short-eared owl	*Asio flammeus*	none/SSC/none	Found in swamplands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**Known.** Salt marsh and ruderal habitats provide suitable foraging habitat for this species, which has been observed by Alan Hopkins at the CPSRA.[903] However, suitable breeding habitat is absent due to the limited extent of marsh, human disturbance, and vulnerability of this ground-nesting species to predation.
Short-tailed albatross	*Phoebastria albatrus*	FE/none/none	Pelagic; nests on offshore islands in north Pacific.	**Absent.** Suitable habitat does not occur in the Study Area.
Tricolored Blackbird	*Agelaius tricolor*	none/SSC/none	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	**Known.** Ruderal and developed areas on the site provide potential foraging habitat for this species, and the tricolored blackbird has been observed by Alan Hopkins at the CPSRA.[904] However, suitable nesting habitat is absent due to the lack of extensive freshwater marsh vegetation.
Vaux's swift	*Chaetura vauxi*	none/SSC/none	Redwood, Douglas fir, & other coniferous forests. Nests in large hollow trees & snags. Often nests in flocks. Forages over most terrains & habitats.	**Known.** Suitable nesting habitat does not occur in the Study Area. However, individuals may forage aerially over the Study Area.
Western snowy plover (nesting)	*Charadrius alexandrinus nivosus*	FT/SSC/none	Coastal beaches above the normal high tide line in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent.	**Not Likely.** Extensive, open sandy substrate to provide nesting habitat within the Study Area is absent.

[901] Ibid.
[902] Ibid.
[903] Ibid.
[904] Ibid.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*
White-tailed kite	*Elanus leucurus*	none/none/FP	Preferred habitat is marshes and waste fields in the Central Valley and coastal plains of California.	**Known.** Non-native grasslands provide suitable foraging habitat. Large trees in the Study Area provide suitable nesting habitat for this species, although the species is not known to nest there.
			MAMMALS	
Blue whale	*Balaenoptera musculus*	FE/none/none	Coastal and pelagic environments frequently found on the continental shelf off the California coast.	**Absent.** Suitable habitat does not occur in the Study Area.
Finback whale	*Balaenoptera physalus*	FE/none/none	Pelagic; usually found 25 miles or more off shore.	**Absent.** Suitable habitat does not occur in the Study Area.
Guadalupe fur seal	*Arctocephalus townsendii*	FT/ST/FP	Rocky insular shorelines and sheltered coves.	**Absent.** Suitable habitat does not occur in the Study Area.
Right whale	*Eubalaena glacialis*	FE/none/none	Pelagic, occurs mainly over continental shelf in the Pacific Ocean.	**Absent.** Suitable habitat does not occur in the Study Area.
Salt marsh harvest mouse	*Reithrodontomys raviventris*	FE/SE/FP	Salt marshes with a dense plant cover or pickleweed or fat hen; adjacent to an upland site.	**Not Likely.** Small mats of pickleweed adjacent to brackish wetlands and salt marsh habitat in the Study Area are highly disturbed. This species has not been recorded on the Peninsula north of the Foster City/ San Mateo Bridge area in decades.
Sei whale	*Balaenoptera borealis*	FE/none/none	Pelagic; generally in deep water along continental shelf.	**Absent.** Suitable habitat does not occur in the Study Area.
Sperm whale	*Physeter catodon*	FE/none/none	Pelagic; prefers deep water but is sometimes found around islands or in shallow shelf waters.	**Absent.** Suitable habitat does not occur in the Study Area.
Steller sea-lion	*Eumetopias jubatus*	FT/none/none Critical habitat	Near shore, pelagic when in water. Otherwise on shore, talus or bare rocks. Critical habitat has been defined for stellar sea lion as a 20 nautical mile buffer around all major haulouts and rookeries, as well as associated terrestrial, air and aquatic zones, and three large offshore foraging areas.[905]	**Not Likely.** Suitable habitat does not occur in the Study Area. Designated critical habitat does not occur in the Study Area. The closest designated critical habitat for this species is the Farallon Islands, approximately 33 air miles east of the Study Area.
Western red bat	*Lasiurus blossevillii*	none/SSC/none	Roosts primarily in trees, less often in shrubs, adjacent to streams, fields, or urban areas. Preferred roost sites are protected from above, open below, and located above dark ground cover.	**Moderate.** Trees (such as eucalyptus) provide potential roost sites for solitary migrant individuals.

SOURCE: CDFG Natural Diversity Database (CNDDB), July 2009 for the US Geological Survey's (USGS) 7.5-minute San Francisco South and Hunters Point quadrangles.
California Native Plant Society (CNPS), July 2009 for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles.
US Fish and Wildlife Service (USFWS), July 2009 for the USGS 7.5-minute San Francisco South and Hunters Point quadrangles

[905] National Marine Fisheries Service (NMFS), *Designated Critical Habitat; Stellar Sea Lion*, 58 Federal Register 45269, 1993.

Table III.N-5 Special-Status Species Potentially Occurring within the Study Area

Common Name	*Scientific Name*	*Status[a] Fed/ CA/ other*	*Habitat and Seasonal Distribution in California*	*Likelihood of Occurrence Within the Study Area*

a. Status:

Federal

FE Federally listed as Endangered
FT Federally listed as Threatened
FC Federal candidate species
FPD Federally Proposed Delisted
SC National Marine Fisheries Service designated Species of Concern. Species of Concern status does not carry any procedural or substantive protections under the FESA.

State

SE State listed as Endangered
ST State listed as Threatened
SPD State Proposed for Delisting
SR State Rare
FP California Department of Fish and Game designated "Fully Protected"
SSC California Department of Fish and Game designated "Species of Special Concern"

Other

ESHA Environmentally Sensitive Habitat Area by the California Coastal Commission
SLC California Native Plant Society (CNPS) Ranking Species of Local Concern
1B California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California and elsewhere.
2 California Native Plant Society (CNPS) Ranking. Defined as plants that are rare, threatened, or endangered in California, but more common elsewhere.
3 California Native Plant Society (CNPS) Ranking. Plants About Which More Information is Needed—A Review List.
CEQA Species not currently protected by statute or regulation, but considered rare, threatened or endangered under Section 15380 of the CEQA Guidelines.
Recent modifications to the CNPS Ranking System include the addition of a new Threat Code extension to listed species (i.e., List 1B.1, List 2.2 etc.). A Threat Code extension of .1 signifies that a species is seriously endangered in California; .2 is fairly endangered in California; and .3 is not very endangered in California.

b. Likelihood of occurrence evaluations

- A rating of "**Known**" indicates that the species/natural community type has been observed on the site.
- A rating of "**High**" indicates that the species has not been observed, but sufficient information is available to indicate suitable habitat and conditions are present in the Study Area and the species is expected to occur in the Study Area.
- A rating of "**Moderate**" indicates that it is not known if the species is present, but suitable habitat exists in the Study Area.
- A rating of "**Low**" indicates that species was not found during biological surveys conducted to date on the Project site and may not be expected given the species' known regional distribution or the quality of habitats located in the Study Area.
- A rating of "**Not Likely**" indicates that the taxon would not be expected to occur in the Study Area because the Study Area does not include the known range or does not support suitable habitat.
- A rating of "**Absent**" indicates that no recorded occurrences or suitable habitat(s) occur within the Study Area to support this species. These species are not discussed further in this document.

SECTION III.O PUBLIC SERVICES

III.O.1 Introduction

This section of the EIR discusses public services, including police protection, fire protection, schools, and libraries, and whether the Project would require new or expanded facilities to maintain acceptable service levels. If the population increase or development levels associated with the Project were to trigger a need for expansion or construction of new public facilities, this section analyzes whether the resulting physical changes could result in significant adverse environmental effects. In other words, an increase in staffing associated with public services or an increase in students would not, by itself, be considered a physical change in the environment; however, a physical change in the environment could result from the construction of new facilities or an expansion of existing facilities to accommodate the increased staff or students.

The EIR uses the most current information available since issuance of the Notice of Preparation for all of the public services analyzed in this section. The baseline conditions are identified under each public service category. This section identifies project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid the identified impacts. Analysis of emergency access to the Project site is provided in Section III.D (Transportation and Circulation).

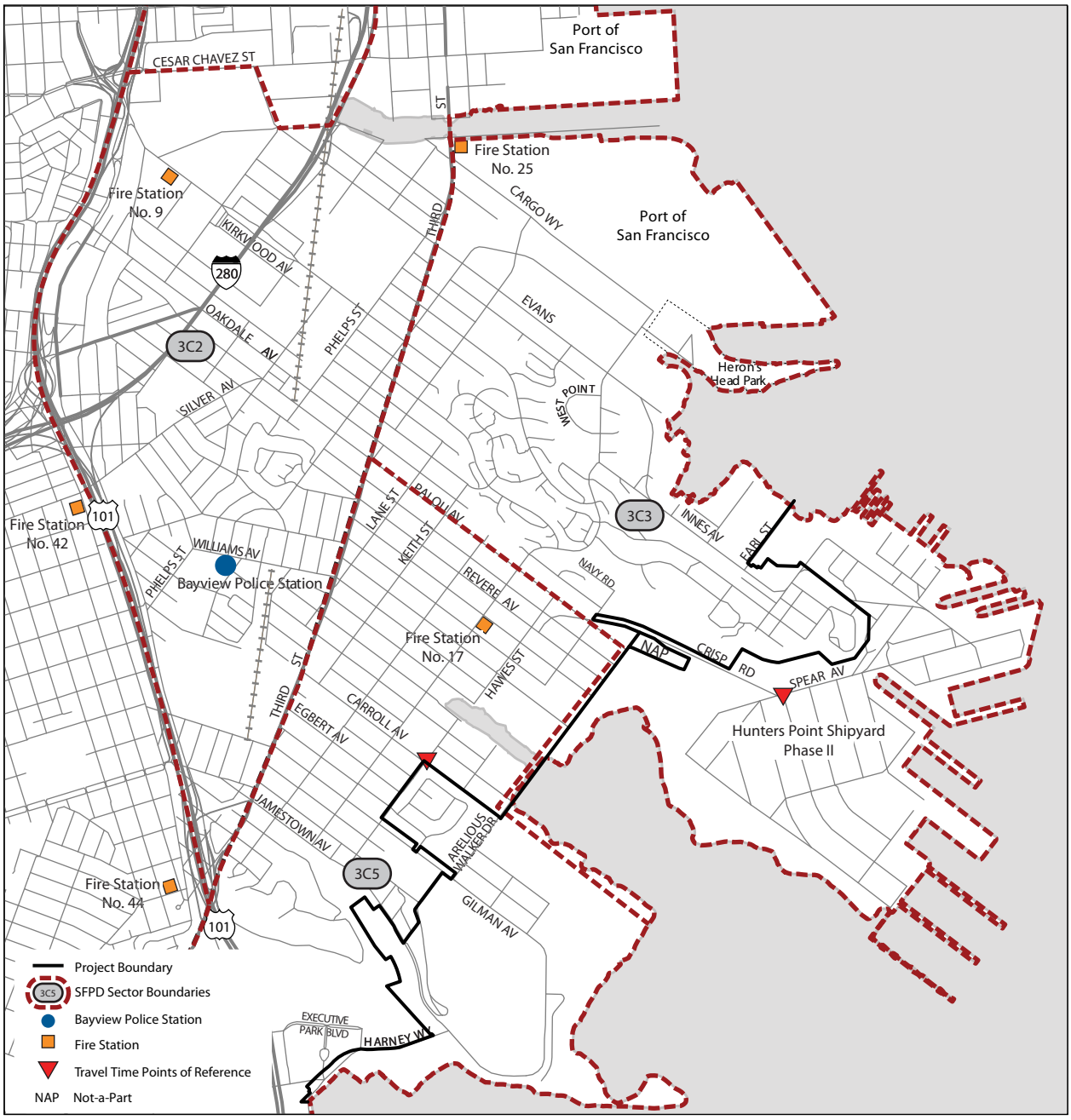
Police Protection

III.O.2 Setting

The San Francisco Police Department (SFPD) provides various public safety services in the City, including the Project site. These services include response to calls (reports of needs for police assistance), officer-initiated activity, traffic management, and general surveillance.

The Project site lies within the SFPD's Bayview District. Police services are provided from the Bayview Police Station, located at 201 Williams Avenue near Third Street. Police operating from this station provide service to the southeastern part of the City, extending along the eastern edge of McLaren Park to the Bay and south from Channel Street to the San Mateo County line. The Bayview District is one of the largest of San Francisco's ten police districts (covering about 18 percent of the City's land area). Refer to Figure III.O-1 (Southeast San Francisco Fire and Police Stations) for the SFPD station locations. The SFPD leases space on Parcel D-1 in Building 606 as a crime laboratory.

The Bayview District is currently divided into five sectors. The sectors are generally divided along Third Street, US-101 and other major roadways in the district. The two sectors that cover the Project site are located east of Third Street and extend from the San Mateo County line north to the Islais Creek channel and are generally divided north/south by Palou Avenue. The three remaining sectors are west of Third Street between Third Street and US-101, and generally divided north/south by Cesar Chavez Street and 24th Street. The last sector is located in the southwest quadrant of the intersection of US-101 and I-280 (Figure III.O-1).



SOURCE: Clement Designs, SFPD San Francisco Redevelopment Agency, PBS&J 2008.

PBS&J 10.31.09 08068 | JCS | 09

Candlestick Point — Hunters Point Shipyard Phase II EIR

FIGURE III.O-1

SOUTHEAST SAN FRANCISCO FIRE AND POLICE STATIONS

Police Operations

Four basic activities account for police services: responding to citizens' requests for service; initiating activities designed to promote order and detect or deter criminal behavior; conducting administrative tasks; and engaging in community policing (attending community meetings; working with community groups, businesses, schools, and other government agencies to prevent and control crime violence and disorder; meeting informally with residents and business people; working on problem solving projects). An organizational assessment of the SFPD, completed in December 2008, recommended a structure for allocating patrol officers' time among those activities.[906] Findings from the study indicate that, in 2007, the proportion of time spent on calls for service varied between 30.0 percent and 50.7 percent among San Francisco's 10 police districts. Citywide, the average was 42.9 percent; in the Bayview District, it was 48.3 percent.

Current Police Activity

Criminal incidents recorded by the SFPD are organized according to the severity of the crime. Part I crimes include aggravated assault, arson, auto boosting, burglary, homicide, larceny, motor vehicle theft, rape, and robbery. Part II crimes range from carrying weapons to receiving stolen property; they include embezzlement, forgery, other (non-aggravated) assaults, disorderly conduct, sex offenses, and others. According to SFPD records, a total of 3,862 Part I crimes were reported in the Bayview District in 2007. These incidents accounted for approximately 9 percent of Citywide Part I crimes (43,690 incidents reported in total). A total of 4,991 Part II crimes were reported in the Bayview District in 2007, or about 11 percent of Citywide Part II crimes (46,822 incidents in total).[907] For comparison, based on the 2000 Census data,[908] the Bayview District accounted for approximately 8 percent of the total City population (60,301 residents in Bayview as compared with 774,385 San Francisco residents)[909] and about 18 percent of the City's land area.[910]

Response Time

The type of police response required varies according to the nature and urgency of the call. Calls for services are categorized as Priority A, B, and C. Priority A calls are of the highest priority, Priority B calls are second in priority, and Priority C calls are the third level of priority. The 2007 Citywide average response times were reported in the *San Francisco Police Department District Station Boundaries Analysis* (*Boundaries Analysis*), and are identified in Table III.O-1 (Citywide and Bayview District Response Times [Minutes]) below. From 2008 to 2009, the overall average response time in the Bayview District has improved and is better than the citywide averages identified in 2007. Incident response times can vary depending on the physical location of patrol vehicles and officers in the district and the proximity to reported incidents.

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[906] Police Executive Research Forum (PERF), *Organizational Assessment of the San Francisco Police Department: A Technical Report, Final Report*, December 2008.
[907] San Francisco Police Department, *2007 Annual Report*.
[908] While Section III.C (Population, Employment, and Housing) uses ABAG Projections, there is no comparable number for the "Bayview," thus Census data was used for this context.
[909] By 2005, the City population had grown to 783,441 according to 2005 population and households provided in a Memorandum from John Rahaim, Director of Planning, San Francisco Planning Department to Michael Carlin, Deputy General Manager, San Francisco Public Utilities Commissions, *Projections of Growth by 2030*, July 9, 2009. This still represents about eight percent of total City population.
[910] Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis*, p. 28, May 18 2008.

Incidents in progress and violent incidents require more immediate response than break-ins, acts of vandalism, or check scams that are discovered sometime after they occurred.[911] There are no adopted response time requirements for Priority A, B, or C calls.

Table III.O-1 Citywide and Bayview District Response Times (Minutes)

	2007 Citywide	*2008 Bayview*	*2009 Bayview*
Priority A	4:36	4:42	2:58
Priority B	8:02	8:31	6:28
Priority C	11:37	14:43	11:40

SOURCE: San Francisco Police Department (SFPD), Compstat-Bayview District, Response Times—June 2008 vs. June 2009 Dispatch to Arrival On-Scene, June 2009; Public Safety Strategies Group (PSSG), San Francisco Police Department District Station *Boundaries Analysis*, p. 44., May 18, 2008.

According to the SFPD 2007 Annual Report, the Bayview District received 6,148 Priority A calls, 10,784 Priority B calls, and 8,944 Priority C calls, for a total of 25,876 calls for service. In addition to calls for service, the Bayview District also dealt with a total of 110,781 on-view (i.e., on site) incidents that required an officer-initiated response.[912] In the Bayview District, pockets of increased police activity were identified directly north and west of HPS in the Hunters Point neighborhood, and in the Bayview and Potrero Hill neighborhoods.[913]

Incidents Associated with Type of Use

Land use and location affects the types of incidents that prompt calls for police assistance. Calls from residences can involve domestic disturbances, neighborhood disputes, burglaries, or drug sales, while calls from retail space can involve shoplifting and traffic incidents. Calls from office space can often involve burglaries (auto or personal items), and calls from entertainment uses depend largely on the type of tenants; busy nightclubs can have fights, and retail uses can have burglaries.[914]

The pattern of calls in existing retail areas provides an indication of the types of calls to expect in new retail areas. Call patterns near San Francisco Centre (the area within a 500-foot radius of Market and Fifth Streets in downtown San Francisco) and near Stonestown Galleria (the area within a half-mile radius of the retail center) are illustrative of the pattern associated with retail use. In 2007, the preponderance of calls centered on those retail concentrations related to larceny/theft (55 percent for San Francisco Centre and 37 percent for Stonestown). The second most frequent type of call was for non-criminal incidents (10 percent for San Francisco Centre and 7.4 percent for Stonestown).

As identified in the *Boundaries Analysis*, one factor impacting the demands for police services is personal and family income. In the Bayview District, similar to the Tenderloin, Mission, and Southern, Northern, and Central areas, which are areas that have 20 percent to 50 percent of the population living below the poverty level, there is a consistently recorded higher need for police services.[915]

911 PBSJ Meeting with SFPD on April 22, 2008.
912 San Francisco Police Department (SFPD), *2007 Annual Report*.
913 Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis*, p. 35, May 18, 2008.
914 PBSJ Meeting with SFPD on April 22, 2008.
915 Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis*, p. 29, May 18, 2008.

Staffing

In 2008, citywide, the Police Department had 2,449 budgeted positions for uniformed officers, of which 2,374 were filled, which represents approximately 97 percent of budgeted positions.[916] In 2005, the SFPD had a total of 2,033 sworn officers.[917][918]

Each of the City's ten district stations is staffed by members of the Patrol Division, which, together with the Traffic Division, make up the Field Operations Bureau. The Patrol Division, supported by Field Operations Bureau staff, is responsible for community policing throughout San Francisco by car and on foot. Bayview Station personnel include command staff, administrative officers, and patrol officers. In the first half of 2009, the staff of sworn officers at the Bayview Station ranged from 138 to 148 officers depending on new recruit levels and other variables.[919] Officers are assigned by sector, and the number of officers on patrol varies by shift, with the shifts staggered throughout the day; each sector in Bayview is staffed with 12 officers at all times.[920]

The SFPD also provides a "housing team" at the Alice Griffith public housing facility, which is located on the Project site. Citywide, housing teams are provided at each public housing facility.[921] In April 2009, the San Francisco Housing Authority (SFHA), in collaboration with the SFPD, implemented a Housing Liaison Program that provides supplemental law enforcement services to several large family developments, including the Alice Griffith public housing facility. Since the program was initiated in 2004 and covered select housing sites (not including Alice Griffith until 2009), the SFHA has experienced a reduction in violent crime.[922] The housing team at Alice Griffith consists of four officers; two per shift for two 12-hour shifts, seven days per week. During the shift officers must spend at least 50 percent of their time on foot, become involved with youth at the site, and officers are not called from their community policing assignments unless there is an emergency.[923] The presence of this housing team does not preclude the presence of a patrol car through the area, and the Bayview Station still responds to calls for service from the housing site if necessary.[924]

Additional officers are stationed in Candlestick Park on football game days, supplementing officers on regular duty assignments. The Bayview Station provides two officers to assist in traffic control and security

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916 PBSJ Meeting with SFPD on April 22, 2008.
917 Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis*, p. 44, May 18, 2008.
918 Although 2008 and 2009 staffing data are provided to identify trends, for the purpose of this section, 2005 data, including staffing levels, are used as the baseline to be consistent with Section III.C (Population, Housing, and Employment), which utilizes 2005 population and employment data to evaluate growth impacts associated with the Project.
919 Personal communication, John Loftus, Captain, Bayview District Station to Chad Mason, PBS&J, July 28, 2009.
920 PBSJ Meeting with SFPD on April 22, 2008.
921 The Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis, Final Report*, May 13, 2008.
922 San Francisco Housing Authority (SFHA), Resolution Authorizing the Executive Director to Enter Into a One year Memorandum of Understanding Between the San Francisco Housing Authority and the San Francisco Police Department for Supplement Law Enforcement Services in an Amount not to Exceed $650,000, April 13, 2009.
923 San Francisco Housing Authority (SFHA), Resolution Authorizing the Executive Director to Enter Into a One year Memorandum of Understanding Between the San Francisco Housing Authority and the San Francisco Police Department for Supplement Law Enforcement Services in an Amount not to Exceed $650,000, April 13, 2009.
924 PBSJ Meeting with SFPD on April 22, 2008.

during games. The balance of the coverage, generally from 18 to 22 off-duty officers, is assigned through the SFPD Homeland Security Unit. They are paid at overtime rates to work inside the stadium, patrol the parking lots, or assist with traffic control in the vicinity of the stadium. The cost of service is currently borne by the 49ers.[925]

Facilities

The Bayview Station opened in February 1997. The station is located about one mile west of Candlestick Point, and is about two miles from the northwest-most portion of HPS Phase II (refer to Figure III.O-1). The Bayview Station has approximately 16,000 square feet of interior space and an estimated 6,000-square foot surface parking lot.

A review of district police stations has recently been conducted as part of an evaluation of the boundaries of SFPD district stations. The *Boundaries Analysis* prepared by the Public Safety Strategies Group (PSSG) in 2008 made several relevant findings for this EIR analysis:

1. There is an immediate need for two new stations for the Central and Southern Districts, and the remaining eight stations [including the Bayview Station] do not meet the needs of effective police operations.
2. There are clear and longstanding areas of crime in the northeast and middle area of the City.
3. Workload distribution is not well balanced among the district stations.[926]

One of the results of the *Boundaries Analysis* is to recommend a 5-district system rather than the current 10 districts. While two new stations are identified as being needed in other areas of the City, the Bayview Station is identified for reorganization and reconfiguration to better utilize wasted and unused space and to provide structured parking to meet long-term operational needs and to accommodate additional officers.

According to the *Boundaries Analysis*, crime in the City is not associated with increases in population per se, or with increased commercial, entertainment, or office uses. Crime in the City has been remarkably stable for the 2002–2007 period, along with a stable number of police officers. New ways of policing are required in longstanding crime areas. [927]

III.O.3 Regulatory Framework

Federal

There are no federal police services regulations applicable to the Project.

State

There are no state police services regulations applicable to the Project.

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[925] PBSJ Meeting with SFPD on April 22, 2008.
[926] The Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis*, May 13, 2008.
[927] The Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis,* Table 2, p. 20, May 13, 2008.

Local

There are no local police services regulations applicable to the Project.

III.O.4 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to police services, but generally consider that implementation of the Project would have significant impacts if it were to:

O.a Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, [or the] need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection

Analytic Method

Impacts on police protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. A significant impact would occur if the Project generated the need for additional officers that could not be accommodated at the existing Bayview Station and would require the construction or expansion of a new facility in the Bayview District. This methodology for assessing impacts on police services was determined through interviews with SFPD staff, as well as communications with PSSG, a consulting firm hired by the SFPD to access facilities needs.

Additionally, the Project's potential contribution to cumulative land use impacts is evaluated in the context of existing, proposed, and reasonably foreseeable future development expected in the Project vicinity.

Construction Impacts

Impact PS-1: Police Protection during Construction

Impact PS-1 **Construction activities associated with the Project would not result in a need for new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police protection. (Less than Significant with Mitigation)** ***[Criterion O.a]***

Construction activities could result in increased demand for police services if construction activities cause traffic conflicts requiring SFPD response. Access to the Project site during construction would be maintained by implementation of a construction management traffic plan (CMTP), as required by mitigation measure MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. The program would supplement and expand, rather than modify or supersede any manual, regulations, or provisions set forth by SFMTA, DPW or other City

departments and agencies. A cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the Bayview Hunters Point area would be implemented. These could include construction strategies, demand management strategies, alternate route strategies, and public information strategies.

Construction activities also could increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. To ensure adequate site security, mitigation measure MM PS-1 would require the Project Applicant to provide security during project construction.

MM PS-1 *Site Security Measures During Construction. During site preparation and in advance of construction of individual buildings, fencing, screening, and security lighting shall be provided by the Project Applicant. During non-construction hours the site must be secured and locked, and ample security lighting shall be provided.*

Through implementation of the security measures required by mitigation measure MM PS-1, impacts to the SFPD would be considered less than significant.

Operational Impacts

Impact PS-2: Police Protection during Operation

Impact PS-2 **Implementation of the Project would not result in a need for new or physically altered facilities beyond those included as part of this Project in order to maintain acceptable service ratios, response times, or other performance objectives for police protection. (Refer to Sections III.D [Transportation and Circulation], III.H [Air Quality], III.I [Noise], III.J [Cultural Resources and Paleontological Resources], III.K [Hazards and Hazardous Materials], and III.M [Hydrology and Water Quality]) *[Criterion O.a]***

Evaluating the need for increased SFPD staff when new development is planned involves considering the size, location, and character of the new development. In most instances, development within San Francisco occurs within a fully developed and urban area, and the incremental increase in service area or service requirements associated with any one project is nominal.

However, in this instance, the Project site is mostly underutilized—portions of HPS are secured, and Candlestick Park stadium is quiet except for game days. The *Boundaries Analysis* shows that crime in the Bayview neighborhood is centered on Third Street at Palou and Third Street, south of Gilman. [928] The Project proposes development that would result in a new resident population of 24,465 (resulting from 10,500 housing units) and about 10,730 jobs (refer to Section III.C [Population, Housing, and Employment]). Based on the proposed development, the resident and worker population of the Project site at full build-out would be 35,195.[929] An increase in daytime population of about 34,000 at the Project

[928] The Public Safety Strategies Group (PSSG), *San Francisco Police Department District Station Boundaries Analysis,* Table 2, p. 20. May 13, 2008.

[929] Calculated as the combined total of a resident population of 24,465 and a worker population of 10,730. This is a conservative estimate since it is not likely that the entire resident population and daytime population would be on site at the same time. For this same reason, a separate calculation of the visitor population is not included, this would overestimate the potential daytime population.

site would require a different service delivery. Patrolling this new area and responding to calls would require at the least a redeployment of police services within the Bayview District, or within a wider area given the current recommendations for redistricting. With Mission Bay, a relatively recent example of a "city within a city," the SFPD are investigating a potential new location as their headquarters.[930]

Impacts on police protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels (as measured by the ability of the SFPD to respond to call loads) and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment.

To estimate personnel requirements for new projects, the SFPD considers the size of the incoming residential population and the expected or actual experience with calls for service from other potential uses of the site. Any potential increase in staffing at the SFPD Bayview Station would be expected to take place over time throughout the Project development period with the incremental addition of new housing and new non-residential building space and their occupancy.[931]

- From 2011 to 2017, demolition and abatement activities would occur on HPS Phase II as this is where most of the initial development would occur; the construction of a new 49ers stadium would occur between 2014 and 2017. Aside from earlier demolition and replacement of Alice Griffith housing, most construction at Candlestick Point would occur between 2017 and 2031. The first ten years of development would not see much of an increase in police requirements for service, as the 49ers stadium would replace similar uses on Candlestick Point. As addressed in Impact PS-1, security of the construction areas would be the responsibility of the Applicant. Between 2019 and 2032, as new residential and non-residential uses come online, there would be an increased need for police protection services.

  Although the City has no adopted staffing ratio, the existing "level of service" at the SFPD can be determined by comparing citywide police force staffing[932] to total City population (including both residents and workers). As shown in Table III.O-2 (Citywide Number of Police Officers and Estimated Project Site Demand), using a total City population for San Francisco of 1,351,469 and a police department staffing level of 2,033 in 2005 (consistent with population and employment data used in Table III.C-1 [Existing Population (2005)] and Table III.C-3 [Existing Employment (2005)] of Section III.C), a citywide ratio of 1 officer per 665 people was calculated.[933] This ratio when applied to the total projected resident and employee population of the Project site at build-out, results in a potential increase of 53 police personnel to provide a comparable level of service in the Bayview District. Refer to Table III.O-2.

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930 "Mission Bay May House Police Hub", San Francisco Examiner, February 24, 2009. Available at http://www.sfexaminer.com/local/Mission-Bay-may-house-police-hub-40203627.html.
931 PBSJ Meeting with SFPD on April 22, 2008.
932 Using a Citywide police force staffing number accounts for the mixed-use nature of the Project, which would include a substantial daytime and resident or nighttime population.
933 City population was calculated as a 2005 population of 799,302 plus 2005 employment of 552,167; refer to Table III.C-1 (Existing Population [2005]) and Table III.C-3 (Existing Employment [2005]) of Section III.C (Population, Housing, and Employment).

Table III.O-2 Citywide Number of Police Officers and Estimated Project Site Demand

		Population	*Police Officers*
Citywide (2005)			
Residents		799,302	
Employees		552,167	
	Total	***1,351,469***	***2,033***
Ratio (officer to population)		1:665	
Project (2029)			
Residents		24,465	
Employees		10,730	
	Total	***35,195***	***53***
Ratio (officer to population)		1:665	

SOURCE: The population and households data reported for San Francisco is 2005 data provided in a Memorandum from John Rahaim, Director of Planning, San Francisco Planning Department to Michael Carlin, Deputy General Manager, San Francisco Public Utilities Commissions, *Projections of Growth by 2030*, July 9, 2009.; SFPD 2005 total staffing: PSSG District Station *Boundaries Analysis*, 2008; Proposed population and employment: Section III.C (Population, Housing, and Employment).

The SFPD evaluates the need for additional officers by sector, and not station or district needs. The Project site is located in two of the five sectors within the Bayview District, both of which have been identified as high demand areas. While it is unlikely that 53 new officers would be needed at the outset of project development as development would occur over a 20-year time period, some redistribution of the police presence in the southeastern portion of the City would be warranted by Project development, as described above.

While staffing increases, in and of themselves, would not create a significant environmental impact, the construction of new facilities to serve the additional 53 police officers could create significant environmental impacts. Additional SFPD personnel of this magnitude (i.e., 53 officers) needed to serve the Project would require a station from which to operate. Even if the existing Bayview Station were to be reconfigured and if the existing civilian personnel who occupy the station were to be moved to another facility, the existing space would not be adequate to support 53 new police officers. The exact amount of space that would be needed has not yet been determined. However, using an estimate of 110 square feet per person,[934] the additional 53 police officers would require approximately 6,000 square feet of interior building space. Additional space would be required for staff and visitor parking. According to SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 53 of the additional police officers without the reconfiguration and expansion of the existing station or the construction of a new facility.[935] In addition, the current surface parking lot is not adequate for existing personnel. Structured parking could be provided on the existing parking site.

Currently, the SFPD has no plans for expansion of its Bayview Station. According to the *Boundaries Analysis*, Bayview Station is not among the priorities for replacement, expansion, improvement, or correction of current deficiencies. However, according to PSSG, there is a considerable amount of wasted or unused space

[934] The Bayview Station is similarly sized to the other stations in the City, each of which is targeted for reconfiguration, and is approximately 16,000 gsf, and the capacity is about 140 officers, resulting in about 114 sf per officer.
[935] Personal communication, John Loftus, Captain, Bayview District Station to Allison Wax, PBS&J, August 31, 2009.

at the Bayview Station that could be reconfigured to accommodate additional officers.[936] If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 square feet (sf) could be constructed within the Project site on land designated for community-serving uses. As part of the Project, up to 100,000 gross square feet (gsf) divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses. These uses have been anticipated as part of the Project, and the impacts of their construction are evaluated in this EIR. As such, in the event that a new police facility (counter, storefront, or other configuration) should be constructed on the Project site, construction of the new facility has been addressed in this EIR. With the construction of a new facility or a suitable retrofitting or expansion of the Bayview Station, the SFPD would have ample space to accommodate the additional police officers needed to maintain the SFPD's existing level of service. This analysis assumes that staffing associated with the Project could be accommodated within the Project site.

Construction activities associated with the proposed public facilities, which could include a potential 6,000 square foot building space for new police officers, are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D (Transportation and Circulation), Section III.H (Air Quality), Section III.I (Noise), Section III.J (Cultural Resources and Paleontological Resources), Section III.K (Hazards and Hazardous Materials), and Section III.M (Hydrology and Water Quality). Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[937]

- As the Project identifies community service use areas that could be used for police services, and as police services are not tied to a specific station, the SFPD would be able to maintain acceptable levels of police service during operation of the Project. While the development of the Project may require new or physically altered police facilities in order to maintain acceptable police services, the potential impacts associated with the construction of a new facility have been addressed in this EIR and would not require further environmental review. As such, no mitigation is required.

Cumulative Impacts

The geographic context for the analysis of cumulative impacts associated with police protection is the City of San Francisco. The past and present development in the City is described in the Setting section of this chapter,

[936] PBSJ Meeting with SFPD on April 22, 2008.
[937] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process. The City of San Francisco provides public services within the City's boundaries.

Development of cumulative projects within the City of San Francisco would result in increased population and employment-generating uses, based on recent projections, and associated increased demand for police protection. The Planning Department routinely prepares projections for the purposes of analyzing impacts of plans and projects undergoing the environmental review process. The Planning Department's recently completed projections, capturing citywide growth expectations by 2030.[938] It should also be noted that the projections also took into account existing conditions and other major projects currently in various stages of the entitlement process, including Executive Park, Visitacion Valley, Hunters View, as well a Treasure Island, Park Merced projects, and the Project. Development projections estimate an increase of 61,814 households, 133,359 persons, and 195,010 jobs from 2005 to 2030, either the latest year for which projections have been formulated or the closest year to Project build-out for projections which extend in five-year increments beyond 2030, consistent with other projections in this EIR.

Citywide, the Police Department has 2,449 budgeted positions for uniformed officers, of which 2,374 are currently filled, which represents approximately 97 percent of budgeted positions. A review of district police stations has recently been conducted as part of an evaluation of the boundaries of SFPD district stations. The *Boundaries Analysis* report identifies improvement needs at most existing stations, noting that the stations are either at capacity or too small for the number of personnel assigned, storage is lacking, locker rooms are inadequate, and technology is outdated and/or non-existent. The report further identifies that most of the stations, despite being fairly new or updated, do not fully meet the needs of the SFPD.[939] Two stations (Central and Southern) are recommended for replacement. However, while the Police Department considers population growth projections in its annual budgeting process to determine equipment and staffing needs for the coming year, it is possible that cumulative growth in the City could exceed the capacity of existing or planned staffing and facility improvements, and could require construction of one or more stations, resulting in a significant impact.

The report does not identify the Bayview station for replacement, expansion, or improvement; correction of current deficiencies at this station is not among the priorities suggested in the *Boundaries Analysis* report. No specific Bayview station needs have been identified for early action. The report does identify the potential for reconfiguration of the existing station and provision of structured parking to meet long-term operational needs at the Bayview station. Project changes in residential and non-residential development levels and land use intensity would take place over a period of years and could, over time, potentially add to SFPD staffing needs. In particular, based on existing call levels to other commercial and retail centers in the City, the Project would be likely to result in an increased number of similar calls for service. As noted, above, an increase in the Bayview station staff to respond to demand from new development would be expected to take place throughout the development period with the addition of new housing units and new non-residential building space and their occupancy. Demand for increased staffing, in and of itself, would not constitute a significant environmental impact. The need for increased staffing, however, could lead to the need for expanded or replacement facilities. Inasmuch as the increased staffing demand could

[938] Correspondence from John Rahaim, Director of Planning, to SFPUC dated July 9, 2009.
[939] Ibid. May 13, 2008, pp. 20 and 27.

be accommodated by a reconfigured Bayview Station and/or a new facility within the Project site, construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[940] Therefore, because the Project would require new or physically altered police facilities in order to maintain acceptable police services, the Project would make a cumulatively considerable contribution to a potential significant cumulative impact on police services. The Project's cumulative impact would be significant.

Fire and Emergency Medical Services

III.O.5 Setting

The San Francisco Fire Department (SFFD) is responsible for protecting life and property throughout San Francisco from fires, natural disasters, and hazardous materials incidents, and by providing emergency medical services.[941] The SFFD has forty-three station locations distributed throughout the City of San Francisco.[942] Staffing at each station is determined based on the types of firefighting apparatuses each station maintains. Engines are staffed with one officer and three firefighters, and trucks are staffed with one officer and four firefighters. The terms "fire engine" and "fire truck" represent different types of fire fighting apparatus. Ambulances are staffed with one paramedic specialist who provide pre-hospital advanced medical and trauma care. Total daily staff for all SFFD stations is currently 315, and the current shift ratio for SFFD is 4.25 shifts per day in 2008.[943] Using this shift ratio and the number of daily staff, approximately 74 staff persons are on duty per shift throughout all of the City's 43 stations.

Of the 43 SFFD fire stations located throughout the City, five of these stations are located in southeast San Francisco. No SFFD stations are located within the Project site itself (refer to Figure III.O-1 for the SFFD station locations). Stations east of US-101 in this part of the City include the following:

- Station 9 is located at 2245 Jerrold Avenue between Napoleon Street and Upton Street

[940] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.
[941] San Francisco Fire Department Website, Mission Statement, The mission statement also includes fire prevention education and goals for the work environment. http://www.sfgov.org/site/sffd_index.asp.
[942] San Francisco Fire Department Website. Station Locations.
http://www.sfgov.org/site/sffd_page.asp?id=57819#stations (accessed on September 11, 2009).
[943] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.

- Station 17 is located at 1295 Shafter Avenue at the corner of Ingalls Street
- Station 25 is located at 3305 Third Street, between the bridge over the Islais Creek Channel and Cargo Way

Stations west of US-101 in this part of the City include the following:

- Station 42 is located at 2430 San Bruno Avenue between Silver Avenue and Silliman Street
- Station 44 is located at 1298 Girard Street at the corner of Wilde Avenue, about a half block west of San Bruno Avenue

The SFFD target response time goal for Code 1 (non-emergency) calls is 8 minutes, for Code 2 (non life-threatening fire and medical emergencies) calls the response time goal is 20 minutes, and for Code 3 (life-threatening fire and medical emergencies) calls, the highest response priority, the response time goal is 4.5 minutes.[944] When responding to Code 3 calls, responding vehicles use flashing lights and sirens and cross intersections against control lights. The SFFD is currently in the 90th percentile for attainment of all the department's response time goals. Target response times are considered in the planning and siting of new fire stations within San Francisco.[945]

Stations located east of US-101 respond to calls within the Bayview Hunters Point neighborhood. The stations west of the US-101 may also respond; however, the freeway creates an obstruction that makes access to areas east of the freeway more difficult from this location. For Station 42, the closest cross-freeway route is the Silver Avenue undercrossing. From Station 44, the Paul Avenue undercrossing is reached by going north on San Bruno Avenue to Mansell Street and then to Paul Avenue, or the Bayshore Boulevard/3rd Street overcrossing can be reached by going south on San Bruno Avenue to Bayshore Boulevard. Table III.O-3 (Fire Stations in Southeast San Francisco) lists the SFFD stations that serve the BVHP area and the Project site, and the primary fire and emergency medical services they provide.

Table III.O-3 Fire Stations in Southeast San Francisco

Station	*Location*	*Nearest Major Street*	*Paramedic Capable*	*Equipment*	*# of personnel per shift*
9	2245 Jerrold Ave.	Napoleon St.	Yes	Engine, Ladder Truck, Battalion Chief	10
17	1295 Shafter Ave	Ingalls St.	Yes	Engine, Ladder Truck	9
25	3305 Third St.	Cargo Way	Yes	Engine	4
42	2430 San Bruno Ave.	Silver Ave.	Yes	Engine	4
44	1298 Girard St.	San Bruno Ave.	Yes	Engine	4

SOURCE: SFFD. Captain Andy Zanoff, SFFD, personal communications to Mundie & Associates, May 2009; Anne Tam, SFFD, verbal communication with Allison Wax, PBS&J on September 2, 2009.

The number of personnel per shift depends on the equipment at each station. Fire engines require four staff per shift, ladder trucks require five staff per shift, Battalion Chief requires one staff per shift, and ambulances require one staff per day.

An engine carries one officer (a captain or a lieutenant) and three firefighters, one of whom is either a designated Emergency Medical Technician (BLS/basic life support) or a Paramedic (ALS/advanced life support).

944 Ibid.

945 Ibid.

Travel times from fire stations near the Candlestick Point and HPS Phase II sites for an ordinary driver are shown in Table III.O-4 (Access to Candlestick Point and HPS Phase II from Nearby Fire Stations). Because the travel time information presented in Table III.O-4 represents an estimated travel time for an ordinary driver, it is a conservative (i.e., high) estimate of response time for emergency vehicles. Unlike an ordinary driver, an emergency vehicle can stop other traffic by the use of emergency sirens and can pass through intersections with traffic signals at reduced speeds even when receiving a red signal indication. Therefore, the time required to travel to the Project site for an emergency would be reduced, and would be consistent with City response times.

Table III.O-4 Access to Candlestick Point and HPS Phase II from Nearby Fire Stations

Station	*Location*	*Miles from Candlestick Point*	*Estimated Minutes to Candlestick Point*	*Miles from HPS Phase II*	*Estimated Minutes to HPS Phase II*
9	2245 Jerrold Ave.	2.1	7	3.1	10
17	1295 Shafter Ave	0.4	1	2.0	8
25	3305 Third St.	2.1	6	2.5	8
42	2430 San Bruno Ave.	1.4	4	3.8	14
44	1298 Girard St.	**1.4**	4	3.4	12

SOURCE: Estimated distances and travel times were estimated by Mundie & Associates
a. Distances reported are from the indicated station to the Alice Griffith housing complex.

Water supply for fire suppression in San Francisco is provided by an auxiliary water supply system (AWSS). Water for the AWSS is distributed through a network of pipes drawing water from a collection of reservoirs and pumping stations throughout the City. The Project would extend the AWSS to the Project site. Refer to Section III.Q (Utilities) for additional detail about water infrastructure, including the AWSS.

III.O.6 Regulatory Framework

Federal

There are no federal fire protection regulations applicable to the Project.

State

California Fire Code

State fire regulations are set forth in Sections 13000, *et seq.* of the *California Health and Safety Code*, which include regulations concerning building standards (as also set forth in the *California Building Code*), fire protection and notification systems, fire protection devices (such as extinguishers and smoke alarms, high-rise building and childcare facility standards), and fire suppression training.

Local

San Francisco Fire Code

The *San Francisco Fire Code* incorporates by reference the *California Fire Code*, with certain local amendments. The *San Francisco Fire Code* was revised in 2007 to regulate and govern the safeguarding of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises; and to provide for the issuance of permits, inspections, and other SFFD services; and the assessment and collection of fees for those permits, inspections, and services. The SFFD reviews building plans to ensure that fire and life safety is provided and maintained in the buildings that fall under its jurisdiction. SFFD plan review applies to all of the following occupancy types:[946]

- Assembly occupancies (including restaurants and other gathering places for 50 or more occupants)
- Educational occupancies (including commercial day care facilities)
- Hazardous occupancies (including repair garages, body shops, fuel storage, and emergency generator installation)
- Storage occupancies where potential exists for high-piled storage as defined by Fire Code
- Institutional occupancies
- High-rise buildings of all occupancies
- Residential Occupancies, such as hotels, motels, lodging houses, residential care facilities, apartment houses, small-and large-family day care homes, and R-1 artisan buildings (excluding minor residential repairs such as kitchen and bath remodeling and dry rot repair)
- All fire alarm and fire suppression systems

In coordination with the San Francisco Department of Building Inspection (DBI), the SFFD conducts plan checks to ensure that all structures, occupancies, and systems outlined above are designed in accordance with the *San Francisco Building Code*.

Section 511 (Local Fire Safety Feature Requirements) of the *San Francisco Fire Code* requires that buildings 200 feet or more in height must provide at least one elevator approved by the Fire Department for firefighter use under fire conditions. The section also requires that for buildings having floors used for human occupancy located more than 75 feet above the lowest level of Fire Department vehicle access, an air replenishment system shall be installed to provide a means for firefighters to refill air bottles for self-contained breathing apparatus (SCBA) through a permanently installed piping distribution system. The system shall be tested and maintained pursuant to the Fire Department Administration Bulletin.

III.O.7 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to fire services, but generally consider that implementation of the Project would have significant impacts if it were to:

[946] San Francisco Fire Department, *Plan Check,* 2009. http://www.sfgov.org/site/sffd_page.asp?id=57395.

O.b Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, [or the] need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives

Analytic Method

Impacts on fire protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. A significant impact would occur if additional calls anticipated to result from the Project could not be accommodated within SFFD's target Code 3 response time of 4.5 minutes. Code 1 and Code 2 is for non-emergency calls with a response time of 8 minutes and 20 minutes, respectively, and are not emergency-response related.

The SFFD's response time could be affected by inadequate staffing levels caused by increases in demand. An increase in population or development may result in the need for additional fire protection personnel. The methodology for assessing impacts on fire protection and emergency medical services was determined through interviews with SFFD staff, who reviewed projected response times and development intensities at the Project site against the SFFD's target Code 3 response time of 4.5 minutes to determine whether additional staffing and therefore new facilities would be needed to provide adequate future service.[947] This information was then applied to the Project's potential increase in response time.

Additionally, the Project's potential contribution to cumulative land use impacts is evaluated.

Construction Impacts

Impact PS-3: Fire Protection and Emergency Medical Services during Construction

Impact PS-3 **Construction activities associated with the Project would not result in a need for new or physically altered facilities in order to maintain acceptable response times for fire protection and emergency medical services. (Less than Significant with Mitigation)** ***[Criterion O.b]***

During construction of the Project, emergency access to the Project site would be maintained through compliance with the Construction Transportation Management Plan (CTMP) prepared for the Project, as required by mitigation measure MM TR-1. Compliance with the CTMP would ensure that access to the Project site is not obstructed during construction activities. The CTMP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. The program would supplement and expand, rather than modify or supersede any manual, regulations, or provisions set forth by SFMTA, DPW, or other City departments and agencies. A cohesive program of operational and demand

[947] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.

management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the Bayview Hunters Point area would be implemented. These could include construction strategies, demand management strategies, alternate route strategies, and public information strategies. As such, construction of the Project would not impact SFFD response times, nor would it require expansion of or replacement of SFFD stations. Impacts to the SFFD would be considered less than significant.

Operational Impacts

Impact PS-4: Fire Protection and Emergency Medical Services during Operation

Impact PS-4 **Implementation of the Project would not result in a need for new or physically altered facilities beyond those included as part of this Project in order to maintain acceptable response times for fire protection and emergency medical services. (Refer to Sections III.D [Transportation and Circulation], III.H [Air Quality], III.I [Noise], III.J [Cultural Resources and Paleontological Resources], III.K [Hazards and Hazardous Materials], and III.M [Hydrology and Water Quality]) *[Criterion O.b]***

The Project would add 10,500 residential units and substantially increase employment-generating uses, resulting in an employment population of 10,730. The increase in the residential and daytime population (for a total population of 35,195), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services.

Building Safety

All new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help to minimize demand for future fire protection services. In addition, all development, including high-rise residential buildings would be reviewed by DBI and the SFFD to ensure that structures are designed in compliance with the *San Francisco Fire Code*. Section 511.1 and Section 511.2 of the *San Francisco Fire Code* outlines specific requirements for high-rise (i.e., buildings above 200 feet) buildings, and would apply to the Project's proposed high-rise structures. All proposed structures exceeding 200 feet in height would be required to install at least one elevator approved by the Fire Department for firefighter use under fire conditions, and an air replenishment system would be required for buildings intended for human occupancy located more than 75 feet above the lowest level of Fire Department vehicle access. Plan review for structures at Candlestick Point and HPS Phase II for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services at the Project site. In addition, as noted above, development of the Project would also include expansion of the AWSS to provide water infrastructure for firefighting activities. Refer to Section III.P for additional detail about the available water supply at the Project site and the proposed water infrastructure improvements, including the AWSS.

Response Time

As stated in Section III.O.5 (Setting), Stations 44 and 17 provide primary response to the Project site. Three additional stations located nearby could also respond to calls for service. Travel times from fire stations near Candlestick Point and HPS Phase II for an ordinary driver are shown in Table III.O-4, although it is likely that the time traveled from any of these stations would be reduced for emergency vehicles. The SFFD strives to maintain an average response time for fire and medical emergencies of 4.5 minutes, which may not be attainable when emergency vehicles are dispatched to the HPS Phase II site from any of the five stations. Travel times to the HPS Phase II site could take between 8 to 14 minutes based on an ordinary driver; and travel time to the Candlestick Point site could take over 4.5 minutes from Station 9 and Station 25. This estimate is based on the existing street grid to present a conservative (i.e., high) estimate of travel time to the Project site, which would be substantially different under Project conditions.

Candlestick Point

The travel time information represents an estimated travel time that an ordinary driver might experience on routes from existing SFFD stations to points within the Project site. Unlike an ordinary driver, an emergency vehicle can stop other traffic by the use of emergency sirens and can pass through intersections with traffic signals at reduced speeds even when receiving a red signal indication. In addition, Project conditions would include new roadway improvements (refer to Chapter II [Project Description]) that would speed access through and within the Project site. Therefore, the estimated time it takes for emergency vehicles to access the Project site is conservative (i.e., high), and it is likely that the time traveled to the Project site for an emergency would be reduced compared to an ordinary driver, and could be significantly reduced.

Existing SFFD facilities in the Bayview neighborhood would provide adequate response times to most points on Candlestick Point. Access to Candlestick Point would be a key factor in the ability of the SFFD to provide adequate fire protection and emergency medical services to this site. Roads providing access to Candlestick Point include Gilman Avenue, Jamestown Avenue, and Harney Way. SFFD personnel have reviewed the Project and concluded that no additional fire stations would be needed to serve Candlestick Point alone and emergency service can be provided within the average response time of 4.5 minutes, as shown on Table III.O-4.[948] Emergency access to Candlestick Point on game days would be provided via three primary routes: on the Harney Way/Arelious Walker Drive route from the south, emergency vehicles would be allowed to use the BRT-only lane; on Palou Avenue from the west; and from Innes Avenue on the north. No new or physically altered fire or emergency medical facilities would be required in order to maintain an acceptable level of service.

HPS Phase II

As shown in Table III.O-4, portions of the proposed development at HPS Phase II would be at a distance from existing fire stations including those most proximate to the site (Stations 44 and 17), and could take from 8 minutes to 14 minutes to access HPS Phase II. The SFFD strives to maintain a Code 3 emergency response time of 4.5 minutes, which may not be accommodated due to the distance of the nearest station and HPS Phase II. As such, a new fire station located in closer proximity to the Project site would be

[948] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.

needed to ensure adequate response times for HPS Phase II. The SFFD does not consider response time to the furthest extent of the HPS Phase II site to be acceptable, given the density of proposed development and the distance for the nearest fire station.[949] SFFD staff concluded that a fire station would be needed at a site that would offer more rapid response to the HPS Phase II site. Initial SFFD recommendations for such a station included providing one engine (four staff), one truck (five staff), and one ambulance (staff requirements not indicated). Both Station 9 and Station 17 include one engine and one truck, and their approximate building size is 6,100 gsf and 6,000 gsf, respectively. Neither station includes an ambulance. A new approximately 6,000-gsf SFFD station (or larger if an ambulance were accommodated) could be accommodated on the Project site, on land designated for community-serving uses. As part of the Project, up to 100,000 gsf divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses.

These uses have been anticipated as part of the Project and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[950] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. With the construction of a new SFFD facility located in closer proximity to HPS Phase II, emergency response times would be reduced due to the reduced distance that dispatched vehicles would be required to travel to access the Project site.

Game Day Access

The 49ers football stadium would require particular consideration and planning to ensure that adequate access is provided during athletic or other events. Those events result in higher than typical traffic, and high volumes of traffic put emergency vehicles in competition with civilian cars for traffic lanes. An access network capable of clearing lanes for emergency vehicles when needed would alleviate this potential problem. Prior to construction of new land uses at HPS Phase II, review of access strategies for game day and non-game day scenarios would be required pursuant to the SFFD's plan review requirements.[951]

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[949] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.
[950] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.
[951] San Francisco Fire Department, Plan Check website. http://www.sfgov.org/site/sffd_page.asp?id=57395 (accessed August 2009).

As described in the Candlestick Point-Hunters Point Shipyard Phase II Development Plan Transportation Study (CHS Consulting, Fehr & Peers, and LCW Consulting, October 2009), the Project calls for a new Traffic Management Center, to be staffed by City employees, to dynamically monitor and operate traffic signals along primary ingress and egress routes to efficiently move traffic into and out of the area prior to and after games. In addition, similar to existing conditions, traffic control officers would be stationed at key locations to ensure efficient traffic movements.

Similar to existing conditions, the majority of stadium bound traffic would use a portion of US-101 to access the project site on game days. Traffic from the south would predominantly use northbound US-101 and access the site via Harney Way, while traffic from the north would predominantly use southbound US-101 and I-280 and access the site via Cesar Chavez Street, Cargo Way, Evans Avenue, and Innes Street. Some trips to the site would use Bayshore Boulevard or Third Street to access the area via Carroll Avenue, Gilman Avenue and Ingalls Street.

Prior to and after games in the proposed stadium, special measures (similar to those in place for existing football games) would be taken to allow the site's circulation system to accommodate unique game day traffic flows. Prior to games, the site's roadways would be geared towards inbound flow and after games the roadways would be geared towards outbound flow.

Vehicles accessing the new stadium from the south would use Harney Way. Harney Way would be configured to provide four inbound lanes (to the stadium) and one outbound lane between US-101 and Arelious Walker Drive. Arelious Walker Drive, between Harney Way and Crisp Road would provide four inbound lanes. Crisp Road would provide seven inbound lanes between Arelious Walker Drive and the new stadium. The lane configurations would be reversed for post-game conditions. Vehicles accessing the new stadium from the south, would be routed as described above to Crisp Road, where it would be channeled to a Ring Road on the southern portion of the stadium. Access to the internal parking aisles would be from the Ring Road.

Vehicles accessing the new stadium from the north would use Evans Avenue and Cargo Way. These inbound routes would merge at Hunters Point Boulevard/Jennings/Evans. From there, the inbound route along Hunters Point Boulevard and Innes Avenue would provide four inbound lanes and one outbound lane. The lane configurations along Hunters Point Boulevard and Innes Avenue would be reversed for post-game conditions.

On the Harney Way/Arelious Walker Drive route, emergency vehicles would be allowed to use the BRT-only lanes (the BRT-only lanes break off from the primary auto route and continue on Harney Way, east of Arelious Walker Drive, and on Egbert before reconnecting with Arelious Walker Drive immediately south of the Yosemite Slough bridge). Emergency vehicles would also be allowed to use Palou Avenue, which would be transit-only on game days. Both of these routes would be free of congestion, and would offer emergency vehicle access between regional facilities and Crisp Road. Emergency vehicles would be able to enter the stadium parking lot via Crisp Road. Emergency vehicles would also be able to use Innes Avenue, as there would be at least one lane in each direction on this route open to traffic. However, since immediately following games the outbound direction may be congested, this may not be as desirable a route as the Harney Way BRT lanes or Palou Avenue.

Conclusion

Construction of a new SFFD facility on land designated for community-serving uses on the Project site would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. Construction of 100,000 gsf of community facilities, which could include a new SFFD facility, has been included as a component of the Project. Therefore, while the development of the Project may require new or physically altered SFFD facilities in order to maintain acceptable fire protection and emergency medical services, the potential impacts associated with the construction of a new facility have been addressed in this EIR and would not require further environmental review.

Cumulative Impacts

The geographic context for the analysis of cumulative impacts associated with fire protection is the City of San Francisco. The past and present development in the City is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process. The City of San Francisco provides public services within the City's boundaries.

Development of cumulative projects within the City of San Francisco would result in increased population and employment-generating uses, based on recent projections, and associated increased demand for police protection. The Planning Department routinely prepares projections for the purposes of analyzing impacts of plans and projects undergoing the environmental review process. The Planning Department's recently completed projections, capturing citywide growth expectations by 2030.[952] The projections also took into account existing conditions and other major projects currently in various stages of the entitlement process, including Treasure Island, Park Merced projects, and the Project. Development projections estimate an increase of 61,814 households, 133,359 persons, and 195,010 jobs from 2005 to 2030, either the latest year for which projections have been formulated or the closest year to Project build-out for projections that extend in 5-year increments beyond 2030, consistent with other projections in this EIR.

Development of cumulative projects within the City of San Francisco would result in increased population and employment-generating uses, based on recent Planning Department projections, and increased demand for fire and emergency medical services. This increase in demand would potentially affect response times, requiring the construction of new facilities. This would also include increased demand for water and potential improvements in conveyance systems for firefighting purposes. The SFFD target response time goal for Code 3 life-threatening fire and medical emergencies, the highest response priority, is 4.5 minutes. This target response time is considered in planning and siting of new fire stations within the City.

All cumulative projects would be built to *San Francisco Fire Code* standards, which would help to minimize demand for future fire protection services. All development, including high-rise residential buildings up to 40 stories, would meet standards for emergency access, sprinkler and other water systems, and other requirements specified in the *San Francisco Fire Code*. Standards pertaining to equipment access would also be met. Plan review for proposed structures for compliance with *San Francisco Fire Code* requirements, to

[952] Correspondence from John Rahaim, Director of Planning, to SFPUC dated July 9, 2009.

be completed by DBI and the SFFD, would minimize fire-related emergency dispatches, reducing the demand for fire protection services. New or physically altered fire or emergency medical facilities could be required in order to maintain acceptable levels of service from cumulative development, and expansion of the water conveyance system could also be required. Because it is unknown the extent to which such facilities and systems would require expansion and whether such improvements would accommodate projected growth, this is a potentially significant impact.

Existing SFFD facilities in the Bayview neighborhood would provide adequate response times to most points within the Project site. SFFD staff, reviewing considerations of development types and distances, concluded that a fire station would be needed at a site that would offer more rapid response to the Project site. Recommendations for such a station included providing one engine (four staff), one truck (five staff), and one ambulance (staff requirements not indicated), in an approximately 6,000-gsf building. The SFFD land could be accommodated on the Project site. Since adequate response times would be ensured for the Project through provision of a new fire facility, the construction of which is evaluated and mitigated for in this EIR, the Project would not make a cumulatively considerable contribution to any potentially significant cumulative impact on fire and emergency medical services. The Project's cumulative impact would be less than significant.

Schools

III.O.8 Setting

The San Francisco Unified School District (SFSUD) oversees the public school system in San Francisco (K–12). The SFUSD is comprised of 37 preschools and 104 schools serving various grade levels (K–5, K–8, and 9–12). Based on data for the 2008/09 school year, there are approximately 56,000 students currently attending public schools in San Francisco (refer to Table III.O-5 [Existing Classroom Capacity and Enrollment, SFUSD, 2008]).[953] It is estimated that another 20,000 students, 26 percent of the total enrollment, attend local private schools. Over the past decade, student enrollment in the SFUSD has been declining by approximately 0.1 percent annually.[954]

SFUSD is the primary public school provider in the City, accommodating approximately 98 percent of the total public school enrollment. Additional public school facilities include court-sponsored facilities (correctional institutions, court ward facilities, etc.) and public charter schools.

[953] Public school attendance based on: California Department of Education, *2008–09 District Enrollment by Grade, San Francisco Unified*, Educational Demographics Unit, DataQuest System, 2009. http://data1.cde.ca.gov/dataquest (accessed online July 6, 2009). The 2005 American Community Survey reported that public school attendance represents approximately 74 percent of the total school attendance in San Francisco, while private school attendance represents 26 percent of the total.
[954] California Department of Education, *DataQuest*, http://data1.cde.ca.gov/dataquest/ (accessed July 2009).

Table III.O-5 Existing Classroom Capacity and Enrollment, SFUSD, 2008

Type of School	*Number of Schools*	*Capacity*	*2008/09 Enrollment*
Elementary Schools	63	29,260	24,939
Middle Schools	13	11,700	11,816
High Schools	16	17,575	19,688
Alternative Schools (varying grade levels)	10	3,900	—
Public Charter Schools (varying grade levels)	2	1,400	—
Total	***104***	***63,835***	***56,443***

SOURCE: San Francisco Unified School District, *San Francisco Unified School District Capital Plan FY 2009–2018*, Appendix; California Department of Education, 2009. Educational Demographics Unit, Data Quest System: 2008–09 District Enrollment by Grade, San Francisco Unified, 2008. http://data1.cde.ca.gov/dataquest (accessed: July 6, 2009).

As shown in Table III.O-5, there is capacity for approximately 63,835 students in existing SFUSD facilities.[955] Table III.O-5 presents an estimate of existing public school enrollment for those schools. Although neighborhoods with a high population of school-age children generate a proportionally high level of demand for nearby schools, SFUSD assigns students to schools based on a lottery system. This system ensures that student enrollment is distributed to facilities that have sufficient capacity to adequately serve the educational needs of students. The SFUSD provides bus transportation to students who attend schools outside of the neighborhood in which they reside.[956]

With enrollment declining in the District, SFUSD has been closing schools. The SFUSD's capital facilities program has focused on replacing older schools and modernizing other facilities. The *San Francisco Unified School District Capital Plan* identifies a range of physical improvements necessary to modernize existing facilities, such as providing access compliant with the Americans with Disabilities Act (ADA), upgrading science and computer labs, expanding arts facilities, and other improvements. In addition, the SFUSD has a backlog of deferred maintenance needs.

Project Vicinity

Schools located in the vicinity of the Project site covering grades K–12 are listed in Table III.O-6 (San Francisco Unified School District Facilities in the Project Vicinity). Schools in the vicinity of the Project site are generally in the Bayview neighborhood, but also include facilities to the north in the Mission neighborhood and to the west in the Visitacion Valley neighborhoods. During the 2008/09 school year, those schools in the Project vicinity had a combined enrollment of 2,980 students and an existing capacity of 5,900 spaces. Public school locations in the Project vicinity are illustrated in Figure III.O-2 (Southeast San Francisco Schools and Libraries).

[955] San Francisco Unified School District, *San Francisco Unified School District Capital Plan FY 2009–2018*, Appendix, 2008.
[956] San Francisco Planning Department and Redevelopment Agency, *Visitacion Valley Redevelopment Program Final Environmental Impact Report*, Section 14 Public Services, p. 14-6, December 2008. A copy of this document is on file for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.

Table III.O-6 San Francisco Unified School District Facilities in the Project Vicinity

Facility	*2008/09 Capacity*[a]	*2008/09 Enrollment*[b]	*2008/09 Remaining Capacity*	*Percentage of Capacity Remaining*
Bret Harte Elementary (K–5)	500	261	239	48%
Malcolm X Academy Elementary (K–5)	500	118	382	76%
Dr. George Washington Carver Elementary (K–5)	500	266	234	47%
Dr. Charles R. Drew Elementary (K–3)	600	267	333	56%
Willie L. Brown Jr. Elementary (K–5)	325	221	104	32%
Subtotal Elementary Schools	*2,425*	*1,133*	*1,292*	*53%*
Dr. Martin Luther King Jr. Middle School (6–8)	525	500	25	5%
Horace Mann Middle School (6–8)	825	330	495	60%
Visitacion Valley Middle School (6–8)	850	306	544	64%
Subtotal Middle Schools	*2,200*	*1,136*	*1,064*	*48%*
Thurgood Marshall High School (9–12)	1,275	712	563	44%
Subtotal High Schools	*1,275*	*712*	*563*	*44%*
Total	***5,900***	***2,981***	***2,919***	***49%***

SOURCES:

a. SFSUD, Capital Plan, 2009–2018, September 2008.

b. California Department of Education Educational Demographics Unit, 2008–09 District and School Enrollment by Grade, San Francisco Unified School District, 2009.

Under existing conditions, there are approximately 43 school-age children living at the Project site, representing a small percentage of overall SFUSD enrollments. The remaining capacity in the 2008/09 school year to accommodate additional enrollment within the Bayview neighborhood include approximately 1,292 elementary, 1,064 middle school, and 563 high school students (Table III.O-6). As shown in Table III.O-6, schools in the vicinity of the Project site have adequate capacity to serve existing enrollment. The total remaining capacity of those facilities during the 2008/09 school year was approximately 49 percent.

III.O.9 Regulatory Framework

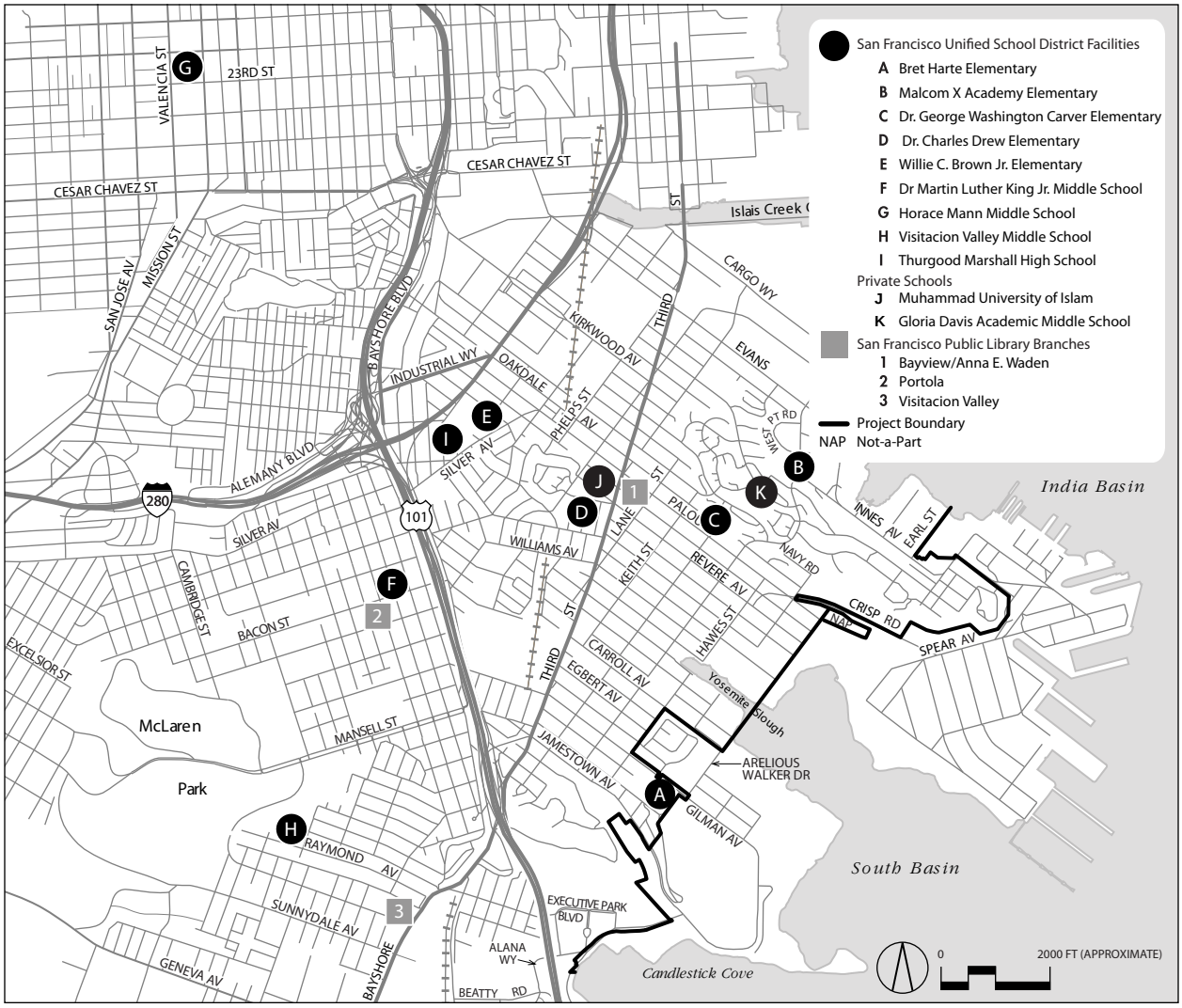
Federal

There are no federal school regulations applicable to the Project.

State

California Senate Bill 50 (SB 50)

The major source of school construction and modernization was the State School Construction Program until the passage of Senate Bill 50 (SB 50) and Proposition 1A, both of which passed on November 3, 1998. SB 50 and Proposition 1A provided a comprehensive school facilities financing and reform program, which authorized a $9.2 billion school facilities bond issue, as well as school construction cost containment provisions



SOURCE: San Francisco Redevelopment Agency, Clement Designs, PBS&J, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE III.O-2

Candlestick Point — Hunters Point Shipyard Phase II EIR

SOUTHEAST SAN FRANCISCO SCHOOLS AND LIBRARIES

and an eight-year suspension of the *Mira*, *Hart*, and *Murrieta* court cases. The provisions of SB 50 prohibit local agencies from denying either legislative or adjudicative land use approvals on the basis that school facilities are inadequate and reinstate the school facility fee cap for legislative actions (e.g., general plan amendments, specific plan adoption, zoning plan amendments), as was allowed under the *Mira*, *Hart*, and *Murrieta* court cases.[957] According to *Government Code* Section 65996, the development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation." The legislation also recognized the need for the fee to be adjusted periodically to keep pace with inflation. These provisions are in effect and will remain in place as long as subsequent state bonds are approved and available. As a result of this legislation, school districts would continue to levy a school fee under existing rules (*Government Code* Sections 65995, 65995.5, and 65995.7).

Local

SFUSD School Impact Fees

The SFUSD began collecting State-authorized school impact fees in 1987, which are collected to mitigate impacts associated with enrollment growth (e.g., new residential development). The SFUSD collects fees for all construction and building permits issued within the City. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects.[958] Table III.O-7 (San Francisco Unified School District Adopted School Impact Fees) presents the current fees for new construction, by facility type, when building permits are issued.

Table III.O-7 San Francisco Unified School District Adopted School Impact Fees

Development Type	*Fee per Square Foot*
Residential	$2.24
Office	$0.27
Research and Development	$0.24
Hospitals	$0.22
Industrial/Warehouse/Manufacturing	$0.21
Retail and Services	$0.18
Lodging/Hotel/Motel	$0.09

SOURCE: SFUSD, Personal communication SFUSD Real Estate Department, to Chad Mason, PBS&J, July 28, 2009.

[957] There are a series of appellate decisions known as "Mira/Hart/Murrieta." In *Mira Development Corp. v. City of San Diego* (Mira), 205 Cal. App. 3d 1201 (1988); *William S. Hart Union High School District v. Regional Planning Commission* (Hart), 226 Cal. App. 3d 1612 (1991); and *Murrieta Valley Unified School District v. County of Riverside* (Murrieta), 228 Cal. App. 3d 1212 (1991), the courts held that the limitations of the School Facilities Law of 1986 only applied to municipalities when they made adjudicative decisions (such as approvals of parcel maps, use permits, and building permits) but not when they made legislative decisions (such as general plan amendments, zoning changes, and development agreements). Coalition for Adequate School Housing, *Senate Bill 50 and School Facility Fees A Report.* http://www.cashnet.org/resource-center/resourcefiles/71.pdf.

[958] San Francisco Unified School District, 2009–2010 Budget Proposal, Overview of San Francisco Unified School District and San Francisco County Office of Education. http://portal.sfusd.edu/data/budget/FY_2009-10_BudgetProposal.pdf (accessed: July 11, 2009).

III.O.10 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to school services, but generally consider that implementation of the Project would have significant impacts if it were to:

O.c Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, [or the] need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives of the school district

Analytic Method

Impacts on schools are determined by analyzing the estimated increase in student population as a result of Project build-out in 2032 and comparing the increase to the capacity of schools in 2030, the closest year to Project build-out for which housing projections have been calculated, to determine whether new or altered facilities would be required, the construction of which could result in substantial adverse environmental effects.

Additionally, the Project's potential contribution to cumulative school impacts is evaluated.

Construction Impacts

Impact PS-5: School Services during Construction

Impact PS-5 **Construction activities associated with the Project would not affect the provision of school services by decreasing access to school services. (No Impact) *[Criterion O.c]***

Construction of the Project would not result in impacts to the SFUSD system, as construction of the Project would not itself create new residents or students. Also, no SFUSD facilities are located on the Project site. All school services would be available to the community throughout the duration of project construction. As such, no impact to school services during construction of the project would occur. No mitigation is required.

Operational Impacts

Impact PS-6: School Services during Operation

Impact PS-6 **New students associated with implementation of the Project would not require new or expanded school facilities, the construction of which could result in substantial adverse impacts. (Less than Significant) *[Criterion O.c]***

The California Department of Education estimates that one dwelling unit would generate an average of 0.7 students, consisting of 0.5 elementary or middle school students and 0.2 high school students.[959] These

[959] San Francisco, *Eastern Neighborhoods Community Rezoning and Area Plans Final Environmental Impact Report*, August 2008, Initial Study p. 42. This report is on file as part of Case No. 2004.0160E and available for public review at the Planning Department, 1650 Mission Street, Suite 400.

rates are a result of statewide sampling that incorporates widely varying dwelling unit types, households, and other demographic characteristics and are routinely used by school districts that have not developed rates for their local jurisdictions.[960] However, those rates do not reflect demographic characteristics of San Francisco, which has fewer children per household than most communities. Therefore, for planning purposes, the SFUSD uses a student generation rate of 0.203 students (including elementary, middle, and high school students) per new housing unit.[961] The number of students generated by the Project was determined by multiplying the number of Project housing units by the student generation factor of 0.203. The number of students was distributed evenly by grade.

Table III.O-8 (Project Buildout Public School Enrollment Compared to SFUSD Capacity) presents the student enrollment that would be generated as a result of the Project, based on generation rates used by the SFUSD. While 26 percent of the total school-age children in San Francisco now attend private schools,[962] Table III.O-8 conservatively assumes that 100 percent of the school-age children associated with the Project would attend public schools.

Table III.O-8 Project Buildout Public School Enrollment Compared to SFUSD Capacity

Analysis Area	*Elementary School (Grades K–5)*	*Middle School (Grades 6–8)*	*High School (Grades 9–12)*	*Total*
Candlestick Point[a]	735	368	490	1,593
HPS Phase II[b]	248	124	166	538
Total	***983***	***492***	***656***	***2,131***
2030 Citywide Enrollment[c]	33,036	16,518	22,024	71,573
2008 SFUSD Capacity[d]	29,260	11,700	17,575	63,835
2030 Citywide Shortfall	3,776	4,818	4,449	7,738

SOURCE: ABAG Projections 2007; PBS&J, 2009.

The number of new students in the Project site was determined by multiplying the number of proposed housing units by the student generation factor of 0.203. The number of students was distributed evenly by grade.

a. For Candlestick Point, 7,850 residential units multiplied by 0.203 SFUSD student generation rate would result in 1,594 students. 1,594 students divided by 13 grade levels would result in 123 students per grade. 123 students per grade level multiplied by six grade levels for elementary school equals 735; multiplied by three grade levels for middle school equals 368; and by four grade levels for high school equals 490. Totals may not equal due to rounding.

b. For HPS Phase II, 2,650 residential units multiplied by 0.203 SFUSD student generation rate would result in 538 students. 538 students divided by 13 grade levels would result in 41 students per grade. 41 students per grade level multiplied by six grade levels for elementary school equals 248; multiplied by three grade levels for middle school equals 124; and by four grade levels for high school equals 166. Totals may not equal due to rounding.

c. 2030 enrollment was calculated as follows: the 2008/09 SFUSD enrollment was divided by the 2005 Citywide school-age population (5–19 years old), which yields a ratio of 0.558. Similarly, the 2030 Citywide school-age population (5–19 years old) was multiplied by the ratio of 0.558 to yield a projected 2030 SFUSD enrollment of 71,573. Enrollment was distributed evenly across the grade levels. Totals may not equal due to rounding.

d. The total includes capacity for 5,300 students in varying grade levels in alternative schools and public charter schools.

[960] San Francisco, *Eastern Neighborhoods Community Rezoning and Area Plans Final Environmental Impact Report*, August 2008, Initial Study p. 42. This report is on file as part of Case No. 2004.0160E and available for public review at the Planning Department, 1650 Mission Street, Suite 400.

[961] San Francisco, *Eastern Neighborhoods Community Rezoning and Area Plans Final Environmental Impact Report*, August 2008, Initial Study p. 42. This report is on file as part of Case No. 2004.0160E and available for public review at the Planning Department, 1650 Mission Street, Suite 400.

[962] US Census Bureau, American FactFinder, *2005–2007 American Community Survey 3-Year Estimates: County of San Francisco*, 2005. http://factfinder.census.gov (accessed online July 6, 2009).

As shown in Table III.O-8, a total of approximately 2,131 school-age children would live within the Project site following full build-out of the Project. Currently, at Candlestick Point, there are approximately 43 students associated with the Alice Griffith public housing site. After build-out of the Project, there would be approximately 1,593 school-age children living at Candlestick Point. There are currently no students at the HPS Phase II site. After build-out of the Project, there would be approximately 538 total students at the HPS Phase II site.

Comparing the 2008 SFUSD school capacity of 63,835 to a projected 2030 population of 71,573 school age children (recognizing that Project occupancy is projected to occur two years later, in 2032), there is a projected shortfall of about 7,738 seats Citywide, or about a 12 percent shortfall.

As discussed in Section III.O.2 (Setting), improvements are planned for many SFUSD schools, such as replacing older schools and modernizing other facilities. The *San Francisco Unified School District Capital Plan* identifies a range of physical improvements necessary to modernize existing facilities, such as providing access compliant with the *Americans with Disabilities Act* (ADA), upgrading science and computer labs, expanding arts facilities, and other improvements. Those improvements will improve accessibility, add new laboratories, provide better access to computing technology, and provide other advantages over existing facilities. While there are no plans to reduce school capacity at the Project site, in the event that schools located in the Project site reach capacity by the year 2032 (or 2030 as the projections indicate), either due to a reduction in space or an increase in classroom size, the SFUSD may assign students to schools based on a lottery system, which would ensure that student enrollment is distributed to facilities that have sufficient capacity to adequately serve the educational needs of students.

The analysis takes into consideration court decisions that have held that increased enrollment resulting in school overcrowding is considered a "social" rather than a physical environmental impact and is not, in itself, a significant environmental impact requiring mitigation under CEQA (*Goleta Union School District vs. Regents of University of California* [2d Dist. 1995]).[963] Instead, increased school enrollment may only lead to such an impact if the increase would ultimately require physical changes in the environment. Changes such as shifting students to other facilities, beginning year-round schools, and increasing the use of portable classrooms would be considered "social" effects, whereas a condition of present overcrowding and projections of increasing enrollments, which would likely necessitate constructing a new school, changing bus routes, and altering traffic patterns, could be considered "physical" effects. Also, state *Government Code* Sections 65995 and 65996 have pre-empted and limited the ability of cities to exercise their power to mitigate school impacts. The duty of a lead agency to mitigate school impacts beyond State-mandated fees can occur only when a physical environmental effect beyond the mere addition of students to a school occurs. Residential growth within the City over the next 30 years would be addressed by payment of SB 50 fees, and consequently school capacity may have improved by the time Project students are generated. Construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts

[963] California Natural Resources Agency, *CEQA Court Cases Decided in 1995*. http://ceres.ca.gov/ceqa/cases/1995/goleta95.html.

(either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[964]

Further, SFUSD could choose to address its potential future shortfalls in capacity through a wide range of options, including shifting students to other facilities, beginning year-round schools, and/or increasing the use of portable classrooms. While schools in the Project vicinity have approximately 49 percent capacity remaining in 2008/09, it is likely that a 12 percent Citywide overcapacity of SFUSD as a result of citywide population growth in 2030 would occur. The school impact fees paid pursuant to SB 50 would go toward maintaining or improving school facilities to accommodate growth in school attendance. Therefore, SB 50 would ensure that future facilities are provided, and this impact is considered less than significant. No mitigation is required.

Cumulative Impacts

The geographic context for the analysis of cumulative impacts associated with schools is the City of San Francisco. The past and present development in the City is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process. The City of San Francisco and the San Francisco Unified School District provide public services within the City's boundaries. SFUSD is the primary public school provider in the City, accommodating approximately 98 percent of the total public school enrollment. Additional public school facilities include court-sponsored facilities (correctional institutions, court ward facilities, etc.) and public charter schools. As shown in Table III.O-4 there is capacity for approximately 63,835 students in existing SFUSD facilities.

Development of cumulative projects within the City would result in increased population and employment-generating uses, which would result in an associated increase in the number of students to be served by the SFUSD. Over the past several years, the student population has declined, and some schools have been closed, and, as noted, the SFUSD is concentrating its efforts on replacing older schools and modernizing other facilities. The SFUSD began collecting State-authorized school impact fees in 1987, which are collected to mitigate impacts associated with enrollment growth (e.g., new residential development). The SFUSD collects these fees for all construction and building permits issued within the City. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects. According to *Government Code* Section 65996, the development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation." Therefore, cumulative development within the City would not result in a significant schools impact. The Project's cumulative impact would be less than significant.

[964] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

Libraries

III.O.11 Setting

The San Francisco Public Library (SFPL) operates the Main Library at the Civic Center and 28 neighborhood branches distributed throughout San Francisco, providing information in books, other print and non-print formats, or electronic form. The SFPL is dedicated to providing "free and equal access to information, knowledge, independent learning, and the jobs of reading" for San Francisco.[965] During the 2007/08 fiscal year, the main library's collection was 1,297,853 volumes, and all the branch libraries had a collection of 1,203,126 volumes, for an SFPL total of 2,500,979 volumes.[966] Community-based branch libraries, as well as the Main Library, provide reading rooms, book lending, information services, access to technology, and library-sponsored public programs. Most branches offer an event almost every day, often for pre-school and elementary school children: story time, crafts, and videos. Programs for youth include reading and computer-oriented clubs.

All SFPL branch libraries offer books at adult, teen, and children's reading levels. Basic collections consist of fiction, nonfiction, and reference books; magazines; newspapers; audio books; CDs; and DVDS. If specific materials are not available at an SFPL branch, items may be obtained through the library's request system, Link+, or interlibrary loan. Link+ allows SFPL library patrons to borrow items from participating libraries throughout California. Items typically arrive within four days and may be returned to any SFPL branch.[967] Interlibrary Loan involves loaning items from various libraries and institutions in North America that agree to loan items to one another, which may include local universities, such as University of California Berkeley, San Francisco State University, or Stanford University.[968] Most of SFPL's collection of electronic resources is accessible from all branch locations and online 24 hours a day at the SFPL website.

There are three branch libraries within a 2-mile radius of the Project site: the Bayview/Anna E. Waden Branch, the Portola branch, and the Visitacion Valley branch; which are described in Table III.O–9 (Library Branches Serving the Project Site). Public library locations in the Project vicinity are illustrated in Figure III.O–2. In addition to the standard items available at branches, the Bayview branch offers a collection of materials by and about African Americans and has a medium-sized collection of Chinese language materials and a small collection of Spanish language materials. Both the Portola and Visitacion Valley branches offer a medium-sized collection of Chinese language materials. These materials are available to address the needs of each branch community.

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965 San Francisco Public Library Website. http://www6.sfgov.org/index.aspx?page=116 (accessed: July 8, 2009).
966 San Francisco Public Library (SFPL), Table: Collection Size, San Francisco Public Library FY 2007–2008, 2008.
967 San Francisco Public Library (SFPL) Website. http://sfpl.org/sfplonline/linkplus.htm (accessed on September 14, 2009).
968 San Francisco Public Library (SFPL) Website. Interlibrary Loam Frequently Asked Questions. http://sfpl.org/librarylocations/main/illfaq.htm (accessed on September 14, 2009).

Table III.O-9 Library Branches Serving Project Site

Branch	*Location*	*Distance from Project Site (mile)*	*BLIP Improvements*	*Size of New Collection at Opening*
Bayview	5075 3rd Street	0.5	New Branch. Not Yet Begun.	43,000 to 45,000 volumes.
Portola	380 Bacon Street	1.5	New Branch. Opened February 2009	33,000 volumes
Visitacion Valley	45 Leland Avenue	1.0	New Branch. Reopens 2010	35,000 to 40,000 volumes

SOURCE: San Francisco Public Library Website. Branch Library Improvement Program. http://sfpl.org/news/blip/improvementprogram.htm (accessed September 14, 2009); Written correspondence with Brian Bannon, Chief of Branches, San Francisco Public Library with Allison Wax, PBS&J on September 9, 2009.

All branches have room for 10 to 15 percent growth.

In 1994, San Francisco voters passed Proposition E, a charter amendment that created the Library Preservation Fund. This measure established a dedicated fund to be used to provide library services and materials, as well as to operate library facilities. Proposition E established a 15-year mandate that requires the City to maintain funding for the San Francisco Public Library at a level no lower than what it spent during the 1992 and 1993 fiscal year. Voters renewed the Library Preservation Fund in November 2007 (Proposition D).

Branch Library Improvement Program

The Branch Library Improvement Program (BLIP) was launched as a result of a bond measure passed in November 2000 to provide $106 million in funding to upgrade San Francisco's branch library system, and Proposition D, which passed in November 2007, authorizing additional funding to improve the branches. The BLIP is intended to provide the public with seismically safe, accessible, technologically updated, and code-compliant City-owned branch libraries in every neighborhood[969]. Improvements to be made at each branch were determined through the preparation of a "Community Needs Assessment" for each branch, with public meetings, community surveys, and outreach to neighborhood organizations. Design options, such as public meeting rooms, more computers, separate teen facilities, child and adult reading areas, and other library services, were considered. Choices about each branch reflect its budget (which is fixed) input from staff, and input from the neighborhood, in part through community meetings to discuss services and architectural plans.

The SFPL has implemented a number of interim programs to serve the public while branches are closed for renovation or replacement. These include increasing hours at nearby branches, holding programs at neighborhood schools and community centers, and offering bookmobile services.

One of the priorities of the 2000 bond measure was to replace four branches housed in leased facilities with City-owned branches, two of which are located in the Portola and Visitacion Valley neighborhoods. New Portola and Visitacion Valley branches have since been constructed or are currently being constructed. The new one-story, 6,300-square-foot Portola branch opened in February 2009. The branch opened with a collection of 33,000 items and has room to grow 10 percent to 15 percent. Construction of the new Visitacion Valley branch began in summer 2007 and is scheduled to be completed in 2010. The new branch will be approximately 8,500 square feet and will open with a collection of between 35,000 and 40,000 volumes and has been designed to accommodate an additional 10 percent to 15 percent in collection size.

[969] San Francisco Public Library, *Branch Library Improvement Program—Frequently Asked Questions*, 2009. http://www.sfgov.org/site/frame.asp?u=http://www.sfpl.org/ (accessed: July 8, 2009).

The Bayview/Anna E. Waden branch, one of the branches serving the Bayview neighborhood and the Project site, was also identified for renovation under the BLIP, and has been funded as part of Proposition D. Because of the increased service needs in the area, the community support for a new branch, and the difficulty meeting the service needs with a renovation, the SFPL decided to build a new Bayview branch library. The Bayview branch library will be at the same site as the existing branch and the expansion will occupy an adjacent site. The new branch will be approximately 9,000 square feet and will open with a collection of 43,000 to 50,000 volumes with room to grow its collection by 10 to 15 percent. Construction is scheduled to begin in early 2010 and open in late 2011. During construction, library services will be provided by holding programs at neighborhood schools and community centers and by a bookmobile service.[970]

III.O.12 Regulatory Framework

Federal

There are no federal library service regulations applicable to the Project.

State

There are no state library service regulations applicable to the Project.

Local

San Francisco Public Library Strategic Plan (2003–2006)

The SFPL Strategic Plan was adopted in 2003 and remains the guiding document for the SFPL. As stated in the SFPL Strategic Plan, there is no national standard for library service. Instead, each library must evaluate how it may best meet the needs of the community. To this end, the SFPL has developed the Strategic Plan that provides every library facility and program with a unifying organizational vision and system-wide goals. These goals are broad and flexible to tailor services to each unique neighborhood. The Strategic Plan also provides a framework to consider opportunities for new programs and services.[971]

III.O.13 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to library services, but generally consider that implementation of the Project would have significant impacts if it were to:

O.d Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, [or the] need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives for library services

[970] San Francisco Public Library, *New Bayview/Anna E. Waden Branch Library Frequently Asked Questions*, 2009. http://www.sfgov.org/site/frame.asp?u=http://www.sfpl.org/ (accessed: July 8, 2009).
[971] San Francisco Public Library Strategic Plan 2003–2006.

Analytic Method

Impacts on library services are considered significant if an increase in population or development levels would result in an increased demand for library services that would require the need for new or physically altered library facilities in order to maintain acceptable service ratios, the construction of which could result in substantial adverse environmental effects.

Additionally, the Project's potential contribution to cumulative library impacts is evaluated.

Construction Impacts

Impact PS-7: Library Services during Construction

Impact PS-7 **Construction activities associated with the Project would not affect provision of school services by decreasing access to library services. (No Impact)** ***[Criterion O.d]***

Construction of the Project would not result in impacts to the San Francisco Public Library system, as the construction itself would not result in an increase in population requiring library services. Also, no library branches are located on the Project site. All library services would be available to the community throughout the duration of project construction. As such, no impact to library services during construction of the project would occur. No mitigation is required.

Operational Impacts

Impact PS-8: Library Services during Operation

Impact PS-8 **Implementation of the Project would not result in an increase in demand for library services that is not met by existing library facilities in the vicinity that have been expanded or updated. (Less than Significant)** ***[Criterion O.d]***

Residential and nonresidential development associated with the Project would increase demand for local library services in the Bayview neighborhood. The Project would result in a population increase of 24,465 residents and 10,730 employees. The development at Candlestick Point would result in a population increase of 18,290 residents and 3,476 employees, and the development at HPS Phase II would result in a population increase of 6,175 residents and 7,254 employees. Although the Project would result in a substantial direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Each of the three new library branches serving the Project are designed to accommodate 10 to 15 percent growth in their collection size.

Services offered at each library are based on a variety of factors including collection size, and by weighing the benefits of adding community rooms, study areas, and designated spaces for teens, children, and adults. All of the library branches serving the Project site were designed to accommodate 10 to 15 percent growth

in its collection size.[972] If materials are not available at a specific branch, materials can be made available in a matter of days through the SFPL's delivery system, which provides for the delivery of materials from one branch to another branch, utilizes Link+ system to access books at participating libraries in California, or request a loan from the Interlibrary Loan system, which involves loaning items from various libraries and institutions in North America. As such, materials available to library patrons are not limited to those housed at their neighborhood library, making the number of volumes at each branch location not a valid measure to evaluate library services. In the event that additional services are needed in any neighborhood, the SFPL dispatches a bookmobile to address immediate needs and the SFPL's current Strategic Plan would provide guidance as to how to address increased demands resulting from population growth in consideration of the branch's fixed budget.

The new SFPL branches, which would all be completed upon build-out of the Project, would accommodate increased demand from the Project. No additional library facilities would be required to accommodate development proposed in the Project. Impacts to libraries would be less than significant, and no mitigation is required.

However, space within the Project site would also be dedicated to the provision of library services to supplement the expanded Bayview branch library. As part of the Project, a 1,500 gsf reading room and space for automated book-lending machines would be integrated into the community retail and public facilities uses that are proposed.

Cumulative Impacts

The geographic context for the analysis of cumulative impacts associated with libraries is the City of San Francisco. The past and present development in the City is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process. The City of San Francisco provides public services within the City's boundaries.

The Branch Library Improvement Program (BLIP), launched as a result of a 2000 bond measure, included plans for construction of eight new library branches. The BLIP includes completion of a "Community Needs Assessment" for each branch, with public meetings, community surveys, and outreach to neighborhood organizations. Most branch libraries in the City are currently being renovated, or are planned for future renovation, under the BLIP program. As stated in the SFPL Strategic Plan, there is no national standard for library service and each library must evaluate how it may best meet the needs of the community. To this end, the SFPL has developed the Strategic Plan, which provides every library facility and program with a unifying organizational vision and systemwide goals.

Development of reasonably foreseeable future projects within the City, in conjunction with past and present development, would increase resident population as well as generate new employment, which could increase demand on public library resources. The SFPL Strategic Plan is based, in part, on population projections for build-out of the General Plan, which includes the development anticipated at the Project site. All cumulative projects (past, present, and reasonably foreseeable) that are within the identified

[972] Written correspondence with Brian Bannon, Chief of Branches, San Francisco Public Library with Allison Wax, PBS&J, September 9, 2009.

population projections would be understood to have been considered during development of the Strategic Plan. Therefore, it is not anticipated that cumulative development would result in a significant cumulative impact to library services.

Residential and non-residential development associated with the Project would increase demand for local library services in the Bayview neighborhood. As noted, the existing SFPL branches and construction of the proposed Reading Room that is part of HPS Phase II would accommodate the increased demand from the Project. No additional library facilities would be required to accommodate development proposed in the Project. Therefore, no new or physically altered library facilities would be required in order to maintain acceptable service ratios for public library services. There is no significant cumulative impact with respect to library resources, and the Project's cumulative impact would be less than significant.

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SECTION III.P RECREATION

III.P.1 Introduction

This section of the EIR analyzes whether the Project would (1) increase the use of existing parks and recreational facilities such that substantial physical deterioration or degradation of the facilities would occur or be accelerated or that new or expanded facilities would be required; (2) result in substantial adverse construction-related effects associated with the provision of new or physically altered parks and recreational facilities, whether on site or off site; and/or (3) adversely affect existing recreational facilities. This section analyzes the potential for both Project level and cumulative environmental impacts. The analysis in this section concludes that the Project could have potentially significant environmental impacts related to the timing of proposed park; therefore, a mitigation measure is included.

Data used in this section includes information obtained from the San Francisco Recreation and Park Department (SFRPD), the California Department of Parks and Recreation (CDPR), as well as the California Department of Parks and Recreation *Candlestick Point State Recreation Area General Plan* (CPSRA General Plan), Association of Bay Area Governments (ABAG) *San Francisco Bay Trail Plan*, ESA *Windsurfing Memorandum* (refer to Appendix P1 [Windsurfing Report]), San Francisco Bay Conservation and Development Commission *San Francisco Bay Plan*, San Francisco Bay Conservation and Development Commission *Bay Area Water Trail Plan*, and the *City of San Francisco General Plan*.

III.P.2 Setting

Existing Parks and Recreational Facilities

For purposes of this analysis, parks are generally defined as areas of land set aside for various recreational opportunities for the public. Recreational facilities are those structures and/or improvements that are built at parks (e.g., benches, picnic tables, tennis courts, etc.). Open space areas are typically unimproved parkland. Therefore, parks and recreational facilities are typically used interchangeably, whereas open space areas refer to those areas where the land is either kept in its natural state or enhanced in order to return the land to its natural state. However, when calculating the City's overall park acreage, open space areas are considered part of the overall total.

Citywide and Regional Resources

Property in San Francisco that is permanently dedicated to publicly-accessible park and recreational uses totals approximately 5,886 acres.[973] The population of San Francisco as of January 1, 2008, was 824,525,[974] yielding a ratio of, or 7.1 acres per 1,000 San Francisco residents. The City has not established a citywide target ratio of parkland to residents, nor has it adopted a *Quimby Act* ordinance requiring land dedications

[973] San Francisco Planning Department, personal communication, Sue Exline, October 26, 2009.
[974] California Department of Finance, E-1 Population Estimates for Cities, Counties, and the State with Annual Percent Change—January 1, 2008 and 2009 http://www.dof.ca.gov/research/demographic/reports/estimates/e-1_2006-07(accessed online June 12, 2009), and Section III.,C (Population, Employment, and Housing).

or in-lieu fees, because San Francisco's population density, small land mass, and other development constraints make such policies infeasible.[975]

The SFRPD maintains more than 200 parks, playgrounds, and open spaces throughout the City, as well as 15 recreation centers, nine swimming pools, five golf courses, and a number of tennis courts, ball diamonds, athletic fields, and basketball courts. The SFRPD also manages the Marina Yacht Harbor, Candlestick Park stadium, and the Lake Merced Complex. The CDPR owns approximately 120.2 acres at Candlestick Point State Recreation Area (CPSRA) within the Project site, as stated in Table II-4 (Candlestick Point Proposed Land Use Summary) in Chapter II (Project Description). (This acreage does not include the Yosemite Slough Restoration area, which is approximately 34 acres.) The San Francisco Bay Trail (Bay Trail) is a multipurpose recreational trail that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 400-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major bridges in the region. To date, approximately 290 miles of the alignment have been completed.[976]

In the vicinity of the Project site, a segment of the Bay Trail runs from Heron's Head Park around the India Basin Shoreline, with a gap in the middle of the segment near the north side of HPS. In addition, a segment of the trail runs from Candlestick Park south to the southern boundary of Candlestick Point.

As shown in Figure III.P-1 (Existing and Approved Parks and Open Space) there are numerous existing public parks and open spaces located within the Project site and in the nearby vicinity.

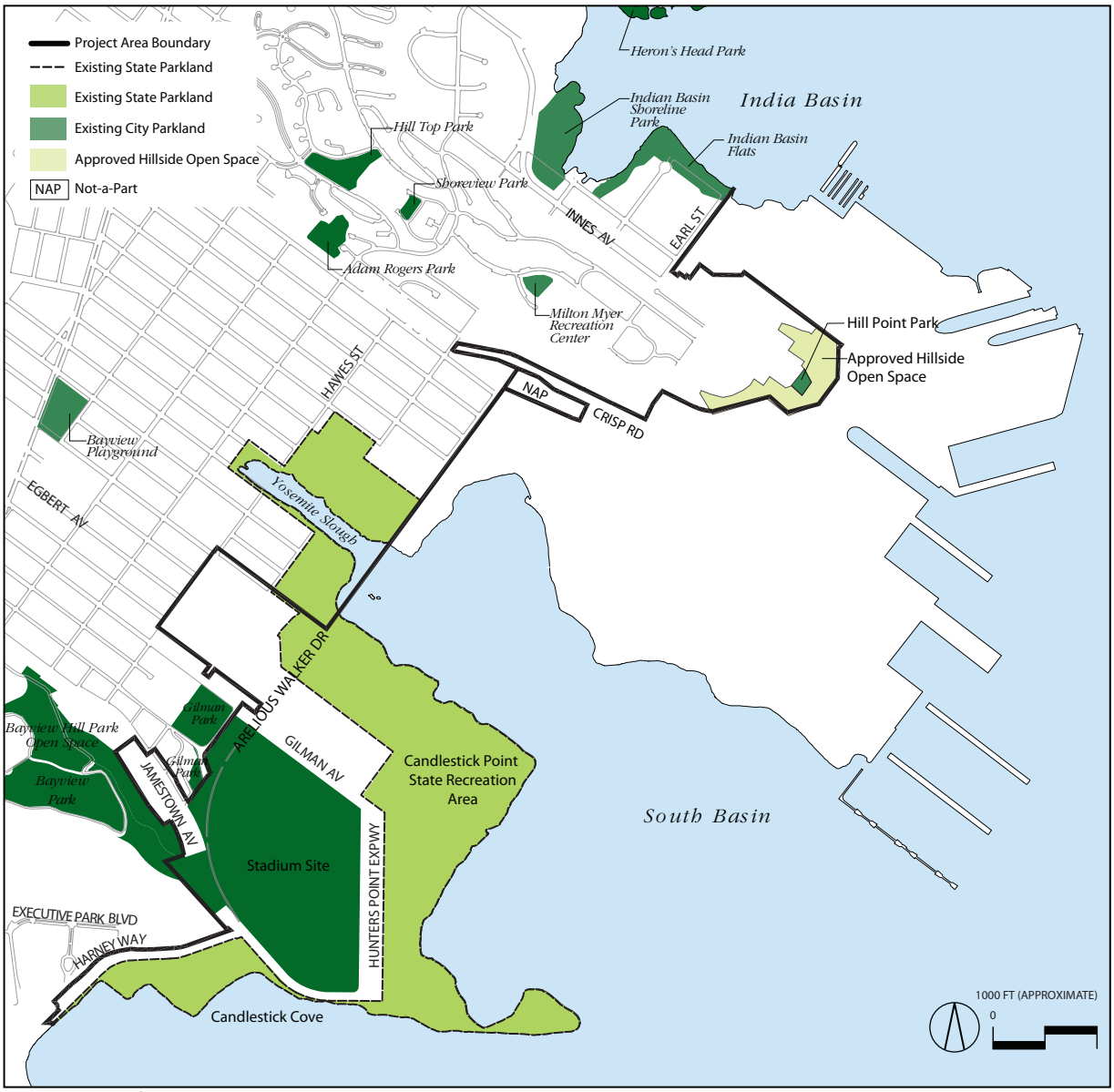
Resources on the Project Site

Two existing parks and recreational facilities, encompassing approximately 203 acres, are located within the Candlestick Point site, as illustrated by Figure III.P-1. These existing parks include the CPSRA and Candlestick Park (home of the existing 49ers stadium). There are no existing public open space areas at the HPS Phase II site.

CPSRA

CPSRA (120.2 acres), on the shoreline of Candlestick Point, was acquired by the State in 1977 for development as a State recreation area. The southern portion of the park is the most developed and actively used area (totaling approximately 47 acres), while the northern areas are unimproved and underutilized (totaling approximately 73 acres). The CPSRA lands to the northeast of Yosemite Slough include a now defunct auto salvage yard, old warehouse, and two business locations that are currently occupied by a sound studio and a cabinet shop. CDPR leases the buildings to these tenants on a month-to-month basis. The southern portions of the CPSRA include picnic areas, a fitness course for seniors, a bike path, shoreline access to the Bay for water-dependent recreation, and recreational trails (Photo 1). CPSRA land to the north and east of the Candlestick Park stadium is currently used for stadium parking; this area total approximately 40 acres. Other portions of the CPSRA site contain construction rubble and debris, such as

[975] City of San Francisco General Plan, Recreation and Open Space Element, 1986.
[976] Association of Bay Area Governments (ABAG), *San Francisco Bay Trail Overview*, 2008. http://www.abag.ca.gov/bayarea/baytrail/overview.html (accessed August 2, 2009).



SOURCE: Lennar Urban, RHAA, 2009; PBS&J, 2010.

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EXISTING AND APPROVED PARKS AND OPEN SPACE

FIGURE III.P-1

the Last Rubble Pile Disposal Site (Photo 2). Until recently, the Last Rubble area was characterized by large piles of rubble and debris, remnants of the site's previous use as a dumping ground. California State Parks, with a grant from the California Integrated Waste Management Board, removed 10 acres of rubble and debris in 2009. As a result of this, the majority of the rubble and debris was either removed or crushed on site. Yosemite Slough is part of the CPSRA, but is not within the Project site except for at its neck, where the proposed bridge would be constructed.

The annual visitation for day use at CPSRA for 2007/2008 was reported as 15,200 paid day-use passes and 200,283 free day-use visitors, for a total of 215,483.[977]

Candlestick Park

Candlestick Park (83 acres),[978] is the site of the stadium owned by the SFRPD and leased by the San Francisco 49ers National Football League team. The existing stadium, built in 1960, seats 70,000 and is used for football games and other non-football entertainment events.

Candlestick Point State Recreation Area is comprised of improved and unimproved park areas.



Improved Area. *Photo 1 is of Main Beach, an already improved area of the CPSRA which includes multi-purpose trails, habitat areas, vegetation, and access to the waterfront. This area is located in the proposed Wind Meadow and Heart of the Park areas (discussed in detail under Impact RE-2).*



Unimproved Area. *Photo 2 is of the Last Rubble Pile Disposal Site. This area, located within the northeastern area of the CPSRA, was formerly used as a concrete dumping ground. More recently, this area underwent debris removal and was marginally improved as a result of a grant from the Integrated Waste Management Board in 2009.*

Other Nearby Facilities. As illustrated by Figure III.P-1, the following SFRPD facilities are within one-quarter mile of the Project site, considered to be walking distance for many users:

- Gilman Park (4.6 acres) is a playground located immediately northwest of Candlestick Park. It includes plastic and metal play equipment with restrooms, picnic tables, a dog area, and a basketball court.

[977] California State Park System, *Statistical Report, 2007/2008 Fiscal Year.* http://www.parks.ca.gov/pages/795/files/07-08%20statistical%20report%20final%20online%20version_2.pdf (accessed on October 13, 2009).
[978] The stadium itself occupies 14.5 acres. The rest of the site is devoted to ancillary uses, such as parking.

- Bayview Park (44 acres), which is off Third Street and Key Avenue immediately west of the Project site, includes picnic areas, natural habitat areas, and recreational trails.
- India Basin Shoreline Park (11.8 acres), on the India Basin Shoreline north of Innes Avenue, includes two children's playgrounds, picnic areas, shoreline access to the Bay for water-dependent recreation, and recreational trails.
- India Basin Flats (also called India Basin Open Space) is unimproved SFRPD property on the Bay periphery of India Basin, northwest of the Project site, off of Innes Avenue. India Basin Flats consists of about 4.5 acres[979] of public land (also referred to as "India Basin Open Space", as indicated on Figure III.P-1, as well as additional, adjacent acreage that is privately held (and not indicated on Figure III.P-1).
- Milton Myer Recreation Center at Kiska Road is a multipurpose facility with meeting spaces, an indoor gymnasium, outdoor game courts, and a children's playground.
- New parks and open spaces (approximately 36 acres) are under development at the HPS Phase I site, adjacent to HPS Phase II.[980] Those parks would provide passive open space, gathering areas, tot lots, trails, view terraces, and picnic facilities.

Other facilities (most of which are operated by the SFPRD) that are located beyond a quarter mile of the Project site, but within approximately one-half-mile of the Project site, include the following:

- LeConte Avenue Mini Park (0.5 acre) is adjacent to and west of Bayview Park (just west of the area shown on Figure III.P-1).
- Bayview Playground (4.6 acres) is a children's playground on Third Street between Armstrong and Carroll Streets that also contains a pool and a softball field.
- The Bayview Hunters Point Multipurpose Senior Center, at Yosemite Avenue and Third Street, offers a range of services and activities for seniors. The Senior Center is not operated by the SFPRD.
- Heron's Head Park (24 acres), formerly known as Pier 98, is a restored wetland owned by the Port of San Francisco and used for research, education, afterschool activities, and natural habitat.
- Other nearby parks also include Hill Top Park (3.4 acres), which includes grassy areas and walking paths; Adam Rogers Park (2.8 acres), which is just south of Hill Top Park, and contains a basketball court, a children's playground, a restroom, and a community garden; and Shoreview Park (0.5 acre), just east of Hill Top Park and on the opposite side of the Jedediah Smith School, contains a children's playground and an open grassy area. Shoreview Park is not operated by the SFPRD.

A number of other small neighborhood parks, playgrounds, and recreational facilities are located beyond a half-mile of the Project site, but within zip code 94124 (east of I-280 and US-101). These include Ridgetop Plaza (0.3 acre), Youngblood-Coleman Playground (6.1 acres), the Joseph Lee Recreation Center (1.9 acres), the Palou-Phelps Mini-Park (3.6 acres), and the Silver Terrace Playground (5.5 acres). While these uses are more than one-half mile from the Project site, they are accessible via direct street connections and are not separated from the Project site by freeways or other physical barriers. Significant other regional recreational resources and parks in the City include Golden Gate Park, Crissy Field, Lake Merced Park, McLaren Park and the Presidio.

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[979] San Francisco Planning Department, Draft India Basin Shoreline Subarea Plan, June 2009.

[980] San Francisco Redevelopment Agency, *Phase I Disposition Development Agreement*, Exhibit D (Public Open Space), 2001. http://www.sfgov.org/site/sfra_page.asp?id=5588 (accessed August 3, 2009). This parkland is expected to be available for use in 2012.

Existing Users

People living and working in a specified area generate local demand for parks and recreational facilities. The current population at Candlestick Point is about 1,113 persons (refer to Table III.C-1 [Existing Population (2005)] in Section III.C [Population, Housing, and Employment]). As stated above, there are a total of approximately 203 acres of existing parks (including the 83-acre stadium site) at the Project site. The local population, however, does not have access to the stadium for general park and recreational use. Therefore, based on a park estimate of 120.2 acres (203 acres less the 83-acre stadium), the existing ratio of persons to acres of parkland is 108 acres per 1,000 residents, which is very high because the site is primarily non-residential and includes the large CPSRA.[981]

III.P.3 Regulatory Framework

Federal

Land and Water Conservation Fund Act of 1965

The *Land and Water Conservation Fund Act of 1965* (LWCFA) was enacted to assist in preserving, developing and assuring accessibility to outdoor recreation resources and to strengthen the health and vitality of US citizens. The LWCFA accomplishes these goals by providing funds and authorizing assistance to states in planning, acquiring, and developing land and water areas and facilities, including through the Land and Water Conservation Fund.

Land that has been acquired or developed with the assistance of the federally created Land and Water Conservation Fund cannot be converted to uses other than public outdoor recreation without meeting certain requirements. Any such conversion requires approval by the Secretary of the Interior to ensure that substitute recreation lands of at least equal fair market value and reasonably equivalent usefulness and location are provided. The California Park and Recreation Commission (CPRC) received three LWCFA grants between 1979 and 1981 to assist with the development of trails, picnic areas, and other amenities on approximately 35 acres of the CPSRA. The reconfiguration of the CPSRA, discussed further below, would comply with the LWCFA. Compliance would require the determination of the fair market value of any of these lands that the Project converts to uses other than public outdoor recreation and the provision of replacement lands of at least equal fair market value and reasonably equivalent usefulness and location.

State

Candlestick Point State Recreation Area General Plan

Refer to Section III.B regarding a description of the CPSRA General Plan and its application to the Project. The following information about the CPSRA General Plan is related to the Recreation analysis.

[981] This park-to-population ratio assumes a population of 1,113, as identified in Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Housing, and Employment). The population of 1,113 correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.

Conceptual land uses and facilities are shown on the CPSRA General Plan Land Use and Facilities map. The Facilities Element lists the following types of recreational uses for the park: trails (hiking, jogging, and bicycling), group picnic areas, family picnic areas, group campgrounds, fishing piers, wind surfing facilities, a sand beach, a quiet area in the southeastern point, scenic overlooks, and a cultural program center. Maritime facilities include a non-powered boat/wind surfing rental facility; a boating center for boat classes and education; a boat access facility that includes a four-lane launching ramp; a 200-space parking area for car-boat trailers; a boat service station; and a ferry landing. A family dinner restaurant and family picnic rest stop are proposed for the Last Port area to the west of Hermit's Cove, off Harney Way.

Current uses in the park include hiking, limited bicycling, day use picnicking, group picnicking, jogging, nature viewing, three sand beaches, undeveloped windsurfing, two piers used daily by fishermen, and three restroom buildings. The park also includes a park staff/maintenance facility, 140 parking spaces for the developed portion of the park, and a community garden.

Some uses have been identified within the CPSRA as potential uses, although they have not been implemented to date, including: group campgrounds; non-powered boat/wind surfing rental facility; boating center; boat access facility that includes a four-lane launching ramp; ferry landing; boat service center; family restaurant and family group rest stop at Harney Way. There is a boat trailer parking area; however, it is not used for boating activities. Every use that has not been developed is still considered a proposed use under the CPSRA General Plan.[982] As such, the CPSRA General Plan has not been fully realized.

As part of the current General Plan process, CDPR's planning staff will facilitate a public planning process to solicit comments and feedback on any new improvements intended for the park. As such, current design and planning elements described in this document represent a proposal. The proposed vision for the park will undergo further review and is subject to change as a result of the General Plan process.

San Francisco Bay Trail Plan

Refer to Section III.B regarding a description of the San Francisco Bay Trail Plan and its application to the Project. The following information about the San Francisco Bay Trail Plan is related to the Recreation analysis.

The Project would include the construction of the Bay Trail throughout the Project. It would support the proposed waterfront trail connection route identified within a 2005 Gap Analysis Study prepared by ABAG for the entire Bay Trail area for the purpose of identifying gaps in the Bay Trail, as well as strategies to complete the Bay Trail system. Following implementation of the Project, the existing trail south of the Project would ultimately connect to the existing northern trail along the India Basin shoreline. The Bay Trail would be accessible for pedestrians and bicyclists with connections to the existing and new parks, from the western boundary of Candlestick Point near the Harney Way/US-101 interchange, through the CPSRA, Yosemite Slough, and HPS Phase II shoreline to India Basin.

Relevant recreation and trail policies from the Bay Trail Plan that apply to the Project with respect to trail alignment and trail design are listed below:

[982] California Department of Parks & Recreation, 2009. Email communication with Steve Bachman, Senior Park & Recreation Specialist, September 16.

- **Trail Alignment Policies**
  - > Ensure a feasible, continuous trail around the Bay.
  - > Minimize impacts on and conflicts with sensitive environments.
  - > Locate trail, where feasible, close to the shoreline.
  - > Provide a wide variety of views along the Bay and recognize exceptional landscapes.
  - > Investigate water trails as an enhancement to the trail system where necessary or appropriate.
  - > In selecting a route for the trail, incorporate local agency alignments where shoreline trail routes have been approved. Incorporate San Francisco Bay Conservation and Development Commission public access trails where they have been required.
  - > Where existing trails through wetlands are well-maintained and well-managed, the Bay Trail can feasibly be routed there. In these cases, trails should be used according to current regulations. Alternate routes should be provided where necessary and additional buffering/transition areas designed to protect wetland habitats should be provided where appropriate to protect wildlife.
  - > In selecting a trail alignment, use existing stream, creek, slough and river crossings where they are available. This may require bridge widening in some locations. In selecting trail alignments, new stream, creek and slough crossings should be discouraged. Where necessary because acceptable alternatives do not exist, bridging may be considered.
  - > In order to minimize the use of existing staging areas along the shoreline and to reduce the need for additional staging areas, the choice of trail alignment should take full advantage of available transit, including rail service (e.g., Caltrain, BART), ferries, and bus service.
- **Trail Design Policies**
  - > Creation of a regionwide hiking and bicycling trail system can be achieved if planning for all trail facilities takes full advantage of opportunities for connections to other existing and proposed recreational systems. The proposed Bay Trail connector trails, in particular, begin to create a regional network by programming links with the Bay Area Ridge Trail.
  - > Wherever possible, new trails should be physically separated from streets and roadways to ensure the safety of trail users.
  - > Create a trail that is as wide as necessary to accommodate safely the intended use, with separate alignments, where feasible, to provide alternative experiences.
  - > Highlight the interpretive potential of certain trail segments, including opportunities for interpretation, education, rest and view enjoyment.
  - > Incorporate necessary support facilities, using existing parks, parking lots, and other staging areas wherever possible.
  - > Design new segments of trail to meet the highest practical standards and regulations, depending on the nature and intensity of anticipated use, terrain, existing regulations, and standards on existing portions of the trail.
  - > Minimum and maximum standards by use, width, surface, etc. should be developed, to ensure safe enjoyment of the trail and compatibility with surroundings and existing facilities, and to encourage use and design of surfaces for which long-term maintenance will be cost-effective.
  - > Design and route the trail to discourage use of undesignated trails.

- A consistent signing program should be established throughout the trail system, using a Bay Trail logo which will identify trails within the Bay Trail system as distinct from other connecting trails. The choice of materials used should be the concern of the individual implementing jurisdictions and agencies.
- The Bay Trail signing program may include necessary cautionary and regulatory signing, including warnings of seasonal trail closings and other restrictions on trail use. Interpretive signing may be provided to help educate trail users about the surrounding environment and the importance of observing trail use restrictions and staying on designated trails.
- The trailhead signing program may include a variety of information which will enhance the Bay Trail experience. This may include a description of the length and relative difficulty of the trail as a guide for trail users with mobility limitations, available support facilities, available access to other connecting trails, and a description of the habitat resource which emphasizes interpretive information as well as the need to observe posted trail use restrictions.

San Francisco Bay Plan

Refer to Section III.B regarding a description of the San Francisco Bay Plan and its application to the Project. The following information about the San Francisco Bay Plan is related to the Recreation analysis.

Recreation-related objectives and policies of the Bay Plan are contained in Part IV—Development of the Bay and Shoreline: Findings and Policies: Recreation objectives and policies that are relevant to the Recreation analysis emphasize the creation of diverse and accessible water-oriented recreational facilities, such as marinas, launch ramps, beaches, and fishing piers. Such facilities should be provided to meet the needs of a growing and diversifying population, and should be well distributed around the Bay and improved to accommodate a broad range of water-oriented recreational activities for people of all races, cultures, ages, and income levels. Recreational facilities, such as waterfront parks, trails, marinas, live-aboard boats, non-motorized small boat access, fishing piers, launching lanes, and beaches, should be encouraged and allowed by the Commission, provided they are located, improved and managed consistent with BCDC policies. Waterfront parks should emphasize hiking, bicycling, riding trails, picnic facilities, swimming, environmental, historical and cultural education and interpretation, viewpoints, beaches, and fishing facilities.

San Francisco General Plan

The Recreation and Open Space Element of the *San Francisco General Plan* contains several policies pertaining to the development of parks and recreational facilities. The following policies are relevant to the development proposed under the Project:

Objective 1 Preserve large areas of open space sufficient to meet the long-range needs of the Bay region.

Policy 1.1 Protect the natural character of regional open spaces and place high priority on acquiring open spaces noted for unique natural qualities.

Objective 2 Develop and maintain a diversified and balanced citywide system of high-quality open space.

Policy 2.1 Provide an adequate total quantity and equitable distribution of public open spaces throughout the City.

	Policy 2.2	Preserve existing public open space.
	Policy 2.7	Acquire additional open space for public use.
	Policy 2.8	Develop a recreational trail system that links city parks and public open space, ridgelines and hilltops, the Bay and ocean, and neighborhoods, and ties into the regional hiking trail system.
Objective 3	Provide continuous public open space along the shoreline unless public access clearly conflicts with maritime uses of other uses requiring a waterfront location.	
	Policy 3.1	Assure that new development adjacent to the shoreline capitalizes on its unique waterfront location, considers shoreline land use provisions, improves visual and physical access to the water, and conforms to urban design policies.
	Policy 3.2	Maintain and improve the quality of existing shoreline open space.
	Policy 3.3	Create the Bay and Coastal Trails around the perimeter of the City which links open space along the shoreline and provides for maximum waterfront access.
	Policy 3.5	Provide new public open spaces along the shoreline.
Objective 4	Provide opportunities for recreation and the enjoyment of open space in every San Francisco neighborhood.	
	Policy 4.3	Renovate and renew the City's parks and recreation facilities.
	Policy 4.4	Acquire and develop new public open space in existing residential neighborhoods, giving priority to areas which are most deficient in open space.
	Policy 4.6	Assure the provision of adequate public open space to serve new residential development.
	Policy 4.7	Provide open space to serve neighborhood commercial districts.

III.P.4 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to recreation, but generally consider that implementation of the Project would have significant impacts if it were to:

P.a Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration or degradation of the facilities would occur or be accelerated

P.b Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives[983]

[983] Thresholds P.a and P.b are discussed together.

P.c Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

P.d Adversely affect existing recreational opportunities

Analytic Method

The Project would provide a wide variety of new and improved parks and open space areas. The Project also proposes an agreement between the CDPR and the City or the Agency to reconfigure the boundaries of CPSRA, which would also result in improvements to the CPSRA. The potential impacts of the proposed agreement are analyzed in Impact RE-3.

The analysis below considers the increase in use that would be generated by the Project and the ability of existing facilities (many of which will be improved by the Project) and new open space that would be provided by the Project to meet that demand. The analysis considers whether an increase in use would result in the substantial physical deterioration of existing recreational facilities (e.g., disturbance of vegetation, accelerated wear on sports facilities and fields, erosion along trails, and an increased potential for increased graffiti and litter) or in the need for new or expanded facilities. The analysis further considers whether the Project would diminish or otherwise adversely affect recreational opportunities at the existing facilities (chiefly CPSRA) on the Project site. The analysis of construction impacts associated with the development of proposed new parks and recreational facilities, which are considered as part of the overall Project, draws on conclusions in other sections of this EIR.

The analysis uses a parkland-to-population ratio to measure demand for recreational facilities. If demand is excessive, then use could result in or accelerate substantial physical deterioration of facilities, or could require the construction of further facilities. If, on the other hand, demand is within an acceptable range, then use will not lead to such impacts. The City does not have an adopted parkland-to-population ratio standard. In the past, the National Parks and Recreation Association has recommended a parkland-to-population ratio as high as 10 acres per 1,000 population. As noted in the Recreation and Open Space Element of the City General Plan, however, "[g]iven the City's existing development patterns, high population density, and small land mass (28,918 acres), [this] standard will not be possible to achieve within the City limits." The General Plan goes on to state that "to the extent it reasonably can, the City should increase the per capita supply of public open space within the City" from the parkland-population ratio at the time of the General Plan's adoption (1986), 5.5 acres per 1,000 residents. This analysis will, therefore, use the 5.5 ratio as a benchmark: a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities.

This standard is consistent with, and in fact provides for more parkland than, other commonly used standards. For example, the state's *Quimby Act* allows jurisdictions to select a standard from 3 to 5 acres of parkland per 1,000 residents when imposing a parkland mitigation requirement. Other nearby Bay Area jurisdictions (e.g., the City of Palo Alto and the City of Menlo Park) use a standard of 5 acres per 1,000 residents.

The Project's potential contribution to cumulative park and recreation impacts, if any, are also evaluated in the context of existing, proposed, and reasonably foreseeable future development expected in the City.

Construction Impacts

Impact RE-1: Construction of Parks, Recreational Uses, and Open Space

Impact RE-1 **Construction of the parks, recreational uses, and open space proposed by the Project would not result in substantial adverse physical environmental impacts beyond those analyzed and disclosed in this EIR. (Refer to Sections III.D [Transportation and Circulation], III.H [Air Quality], III.I [Noise], III.J [Cultural Resources and Paleontological Resources], III.K [Hazards and Hazardous Materials], and III.M [Hydrology and Water Quality]) *[Criterion P.c]***

The Project includes the construction and improvement of substantial new parks, recreational facilities, and open space. At build-out, the Project would include approximately 336 acres of parks and open space as described in Table III.P-1 (Proposed Parks and Open Space) and illustrated by Figure III.P-2 (Proposed Park and Open Space). Candlestick Point would include approximately 104.8 acres of parks and open space, including the CPSRA; HPS Phase II would include approximately 231.6 acres of parks and open space.

Development of the parks and recreational facilities would require construction activities, which could vary depending the location and type of work. If existing structures are located on identified park sites, such structures could require demolition. Sites would be cleared and graded and construction of these new parks could include installation of utilities (electrical, water, sanitary sewer, and storm drainage); hardscape (e.g., concrete, asphalt, stone, walls, sport-court and play area surfacing, decking/boardwalks); new or renovated site structures (e.g., restrooms, picnic/shade shelter's, kiosks, pavilions, overlooks, piers); and site furnishings (e.g., benches, picnic tables, drinking fountains, play equipment, fencing, artwork, lighting). The installation of shoreline protection features would also occur, where necessary. Site planting would include installation of irrigation systems and would focus on re-vegetation and restoration of native plant communities, where possible, and may include creation of new saltwater and freshwater habitats. Open space areas would generally not require extensive construction activities, but could require re-vegetation, the creation of trails, and other non-invasive activities.

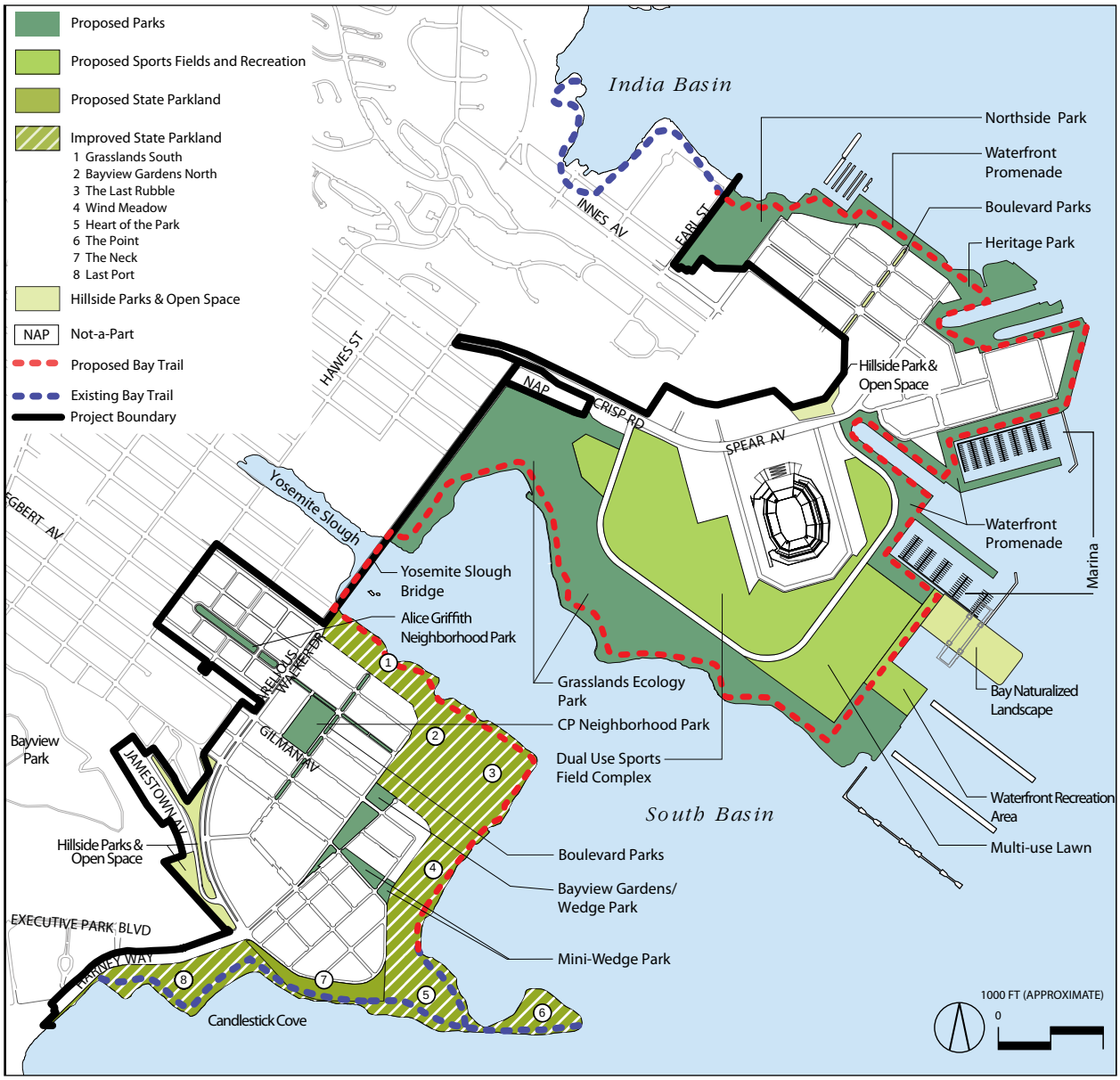
Construction activities associated with the proposed parks and recreational facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of parks and recreational facilities, is provided in the applicable sections of this EIR, including Section III.D (Transportation and Circulation), Section III.H (Air Quality), Section III.I (Noise), Section III.J (Cultural Resources and Paleontological Resources), Section III.K (Hazards and Hazardous Materials), Section III.M (Hydrology and Water Quality), and Section III.N (Biological Resources). Construction impacts would be temporary. While it is likely that construction of the various park and recreational facilities identified in Table III.P-1 would not result in significant impacts (either individually or combined), construction of the entire development program, of which the parks and recreational facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H,

Table III.P-1 Proposed Parks and Open Space

Location		*Acres*
CANDLESTICK POINT		
New Parks		
Alice Griffith Neighborhood Park		1.4
Candlestick Point (North) Neighborhood Park		3.1
Bayview Gardens/Wedge (Destination) Park		2.5
(Candlestick Point South) Mini-Wedge Park		1.1
	Subtotal	*8.1*
New and Improved State Parkland (CPSRA)[a]		
The Last Port (includes 0.4 acre of new State parkland)		14.6
The Neck (includes 3.8 acres of new State parkland)		4.9
The Heart of the Park (includes 1.5 acres of new State parkland)		15.4
The Point		6.1
Wind Meadow		11.4
The Last Rubble		24.5
Bayview Gardens North		9.5
Grasslands South		10.3
	Subtotal	*96.7*
	Total	***104.8***
HUNTERS POINT SHIPYARD PHASE II		
New Parks		
Northside Park		12.8
Waterfront Promenade		29.5
Heritage Park		15.6
Grasslands Ecology Park at Parcel E		44.9
Grasslands Ecology Park at Parcel E-2		37.2
	Subtotal	*140.0*
New Sports Fields and Active Urban Recreation		
Sports Field Complex / Game Day Stadium Parking		59.7
Waterfront Recreation Area		6.7
Multi-use lawn		25.2
	Subtotal	*91.6*
	Total	***231.6***
TOTAL PARKS AND OPEN SPACE		
New Parks		148.1
New Sports Fields and Active Urban Recreation		91.6
New and Improved State Parkland		96.7
	Total	***336.4***

SOURCE: Lennar Urban, 2009

a. The 120.2-acre CPSRA would be reduced by 29.2 acres, and increased by 5.7 acres for a net reduction of 23.5 acres. The Neck, The Heart of the Park, and The Last Port are the three locations where new State Park Land would be added.



SOURCE: Lennar Urban, RHAA, 2009.

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PROPOSED PARKS AND OPEN SPACE

FIGURE III.P-2

Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[984]

In addition, and as further discussed in Impact RE-2 and the cumulative impact analysis, the Project would provide adequate parks, recreational facilities, and open space to accommodate the expected increase in demand resulting from the Project and cumulative development. No further construction would be required beyond that proposed by the Project.

Operational Impacts

Impact RE-2: Deterioration or Degradation of Existing Parks and Recreational Facilities

Impact RE-2 **Implementation of the Project would not increase the use of existing parks and recreational facilities that would cause the substantial physical deterioration of the facilities to occur or to be accelerated, nor would it result in the need for, new or physically altered park or recreational facilities. (Less than Significant with Mitigation)** ***[Criterion P.a]***

The Project would bring new residents to the Project site and increase the use of existing parks and recreational facilities, but it would also provide substantial new parks and recreational facilities, improve existing facilities, and provide long-term funding for operation and maintenance.

At build-out of the Project, the projected population within the Project site would increase from approximately 1,113 to approximately 24,465 residents, and employment would increase from 529 to approximately 10,730 jobs (refer to Section III.C of this EIR). The increase in population and employment would likely result in an increase in the use of existing parks, recreational facilities, and open space. However, new and improved parks, recreational facilities, and open space would be provided as part of the Project to offset the increase in demand on existing parks and open space areas created by the Project's new residents and employees. In fact, a total of 336.4 acres of parks, recreational facilities, and open space would be provided at the Project site, consisting of 239.7 acres of new parks, sports fields, and active urban recreation uses, and 96.7 acres of existing and improved parkland at the CPSRA.[985]

This analysis first identifies the proposed new facilities, and then analyzes whether the increase in the use of parks would lead to the substantial physical deterioration or degradation of existing and proposed facilities or result in the need for new or expanded facilities.

[984] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analyses. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

[985] For comparison purposes, the Project's proposed 336.4 acres of parks and open space would be greater than the 141.5 acres of public open space that was to be provided under the Hunters Point Shipyard Reuse Plan Final EIR (June 2000).

Proposed New Facilities

Overall, the Project would provide a substantial increase in the amount of developed, useable, high-quality parks, recreational facilities, and open space within the Project site. The Project would create a continuous network of interconnected recreational opportunities, promoting the use of the existing parks, such as the CPSRA, as well as the 239.7 acres of new parks, sports fields, and active urban recreation uses. The Project would provide a network of pedestrian and bike pathways that would connect Project uses to the adjacent neighborhoods and would ensure unrestricted public access to the parks and open space on the Project site and the Bay shoreline. Enhanced connectivity of on-site and off-site facilities and new neighborhood parks would allow integration of new and existing facilities into the citywide park network. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users to proposed "destination" parks, parks designed to accommodate regional demand. In addition, the Project would provide a continuous series of waterfront parks from the northernmost part of HPS Phase II to the southernmost part of Candlestick Point.

In addition, proposed recreational facilities, such as paved athletic courts, plazas, and picnic areas, would also support a large number of users within a relatively small area. Recreational facilities proposed for the Project site also include a Sports Field Complex that would provide soccer/football, baseball, and volleyball fields, as well as warm-up fields, restrooms, and food concessions. The parking area for the Sports Field Complex would support parking during stadium events, but would be covered with specially engineered soils and turf to allow dual-use of the parking lot for athletic fields. Recreational facilities would also include a mix of active and passive areas of open lawns, dog runs, play areas, community gardens, and court games. Moreover, improved park facilities would provide a waterfront promenade, ecological open space areas, concessions, restrooms, and other uses that would allow the site to support a large service population.

The discussion below identifies the specific new facilities that are planned within Candlestick Point and HPS Phase II. These facilities are also identified in Table III.P-1, above, and shown on Figure III.P-2. Some features, such as the Bay Trail improvements, span both areas of the Project site.

Candlestick Point

Candlestick Point would include an extensive network of parks, ranging from the CPSRA to smaller parks distributed throughout the neighborhood. The Candlestick Point parks would be connected to other neighborhoods and open spaces by way of pedestrian-friendly green streets.

- The 1.4-acre Alice Griffith Neighborhood Park would extend for several blocks near the center of the neighborhood as an extension of Egbert Avenue.
- Candlestick Point North would include a 3.1-acre Candlestick Point Neighborhood Park in the center of the district.
- The 1.1-acre Mini-Wedge Park in the Candlestick Point South district would serve as a primary connector between Candlestick Point and the CPSRA beach area.
- The Bayview Gardens/Wedge Park (2.5 acres) would serve as the 'commons' for the Candlestick Point development and link the residences to the CPSRA through an expansive view corridor. Specific programming would include an ecological garden, a main plaza, passive lawns, bioswale stormwater retention, and tot lots.

These parks would be connected to other neighborhoods and open spaces within the community by way of pedestrian-friendly green streets.

Candlestick Point State Recreation Area

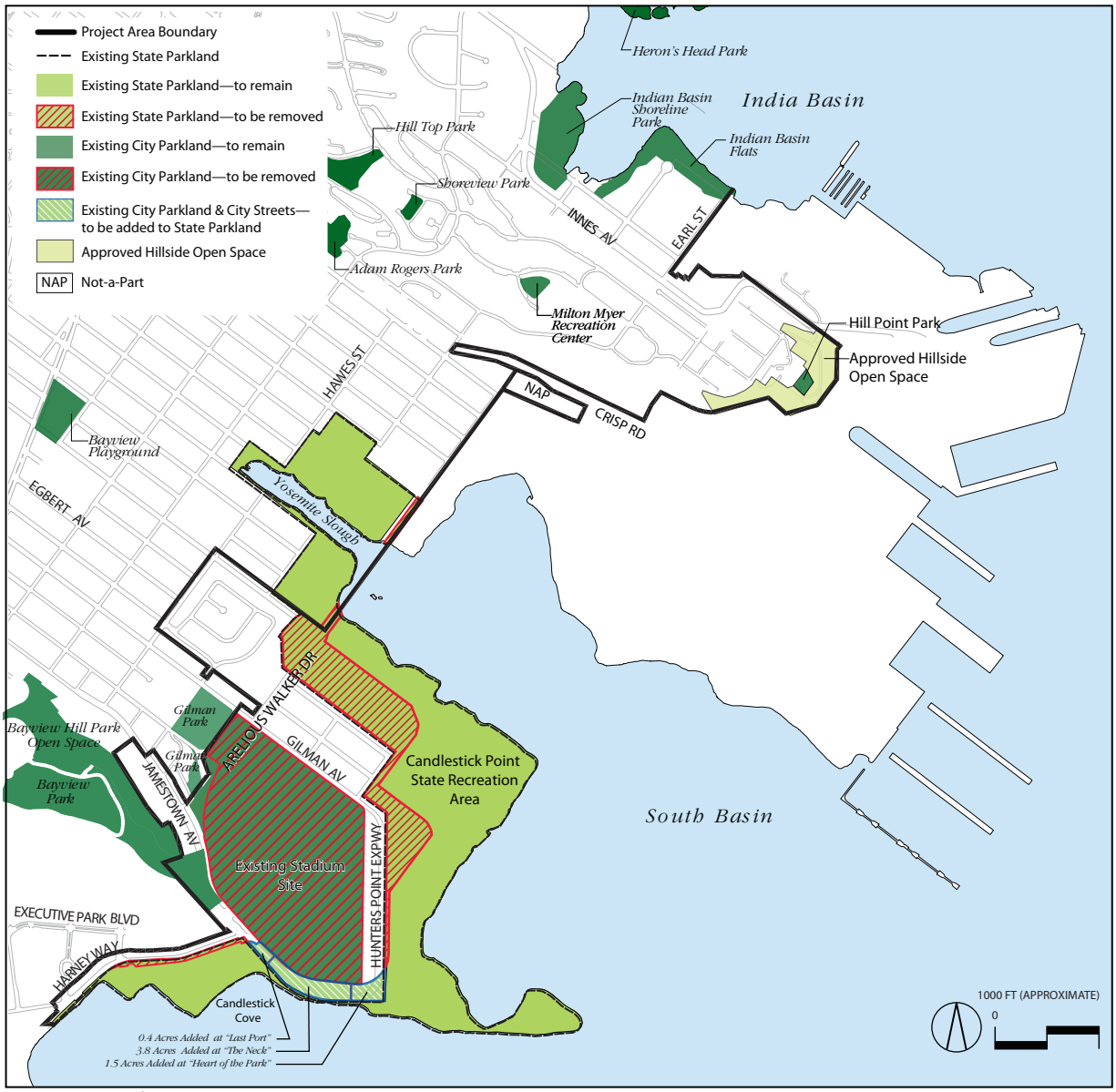
Senate Bill 792 (SB 792) (refer to Appendix P2 [SB 792]) was signed by the Governor on October 11, 2009, and is codified as Chapter 203 of the Statutes of 2009. SB 792 repeals the *Hunters Point Shipyard Conversion Act of 2002,* the *Hunters Point Shipyard Public Trust Exchange Act,* and *Public Resources Code* Section 5006.8, and consolidates the key provisions of those statutes into a statute covering both the Candlestick Point area and HPS. The statute authorizes a reconfiguration of CPSRA coupled with improvements within the park and the provision of an ongoing source of park operation and maintenance funding. The proposed reconfiguration would remove about 29.2 acres from the current boundaries of CPSRA to be used for urban development, but would add about 5.7 acres not currently included in the CPSRA to The Neck, The Heart of the Park, and The Last Port areas of the CPSRA. These additional acres would widen the park in an area where the CPSRA boundary currently runs very close to the shoreline, creating a very narrow "pinch point" in the park. The additional acreage would thus create a buffer between development and the shoreline and improve the recreational value of this section of the park. In total, the area of the CPSRA (excluding the Yosemite Slough) would decrease by about 23.5 acres at the Candlestick Point site, from 120.2 acres to 96.7 acres. Table III.P-2 (Proposed Candlestick Point State Parks Land Agreement) presents the acreage of the areas proposed to be added to and removed from the park. Figure III.P-3 (Proposed CPSRA Reconfiguration) illustrates the area of CPSRA and City parkland to remain or to be removed, and the amount of CPSRA parkland to be added.

Table III.P-2 Proposed Candlestick Point State Parks Land Agreement

	Candlestick Point (acres)
Existing State Parkland at Candlestick Point	120.2
Area removed from State Parkland	(29.2)
Area added to State Parkland	5.7
Proposed State Parkland at Candlestick Point	96.7

SOURCE: Lennar Urban, 2009.

The portion of the park that is currently undeveloped or used for Candlestick Park stadium parking would be substantially improved to enhance overall park aesthetics and landscape ecology; reconnect visitors to the bay shoreline; and provide direct access to the bay for swimming, fishing, kayaking, and windsurfing. Proposed improvements include revegetation and landscaping, shoreline restoration and stabilization, infrastructure improvements (such as trails, pathways, and visitor facilities), a biofiltration pond to cleanse stormwater, the provision of habitat and opportunities for environmental education, 'Eco-Gardens,' and salt-marsh restoration. Although there would be a net decrease in the total area of the CPSRA, the recreational value of the new land with the improvements would increase the area's value.



SOURCE: Lennar Urban, RHAA, 2009; PBS&J 2010.

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PROPOSED CPSRA RECONFIGURATION

FIGURE III.P-3

Specific areas of improvements in the CPSRA are discussed below. The discussion is presented to provide an overview of the conceptual design that is currently proposed. However, the ultimate configuration of each of these areas would be at the discretion of the California Department of Parks and Recreation through the ongoing planning process for the CPSRA.

Figure III.P-4 (Photographs of Existing CPSRA—Areas 1 and 2) through Figure III.P-7 (Photographs of Existing CPSRA—Areas 7 and 8) provide a representative photograph of each of the eight designated areas within the CPSRA that are described below (and illustrated by Figure III.P-2). Figure III.P-8 (Aerial View of CPSRA within the Project Site [Excluding the Yosemite Slough]) shows the existing unimproved and improved areas of the CPSRA and indicates where land would be removed or added relative to the existing CPSRA uses.

The Last Port

The area known as the "Last Port" (south of Harney Way) is presently designated within the CPSRA General Plan for a dinner restaurant, a family picnic rest stop, a parking area, trails, and native trees and shrubs with open grassy areas. Current facilities here include trails, parking, family picnic areas, and a restroom building. Landscape features include open meadow areas, berms planted with trees and shrubs, and a beach. The Project proposes changes to the CPSRA boundary in this area to add approximately 0.4 acre of additional land. In addition, the Last Port and The Neck would include a new beach area (refer to Figure II-21 [Natural Shoreline Recommended Work Map]).

The Project's landscape improvements for the "Last Port" area would focus on pedestrian circulation, safety, and wayfinding; intensifying areas for increased use; improving the overall park aesthetics and landscape ecology; and providing new overlooks and connections to follow the bay shoreline. Native grasslands and shorelines would be restored and stabilized, providing areas for activities such as strolling, picnics, kite flying, fishing, and direct access to implementation of the bay for swimming, kayaking, and windsurfing.

The Neck

The area known as "The Neck" is a narrow strip of land south of Jamestown Avenue between Harney Way and Hunters Point Expressway. This area is presently designated in the CPSRA General Plan for native trees and shrubs with open grassy areas, trails, picnicking, fishing, and windsurfing. Currently, a pier provides access for fishing and windsurfers use this area as a launching point, although no formal facilities for windsurf launching or lay-down areas are currently provided. The Project proposes reconfiguring the CPSRA boundary here to provide approximately 3.8 acres of additional land and a wider park along the shoreline, including a new beach area. Project facilities would include trails and overlooks, a parking lot, picnic areas, and a windsurf lay-down and launch area.

The Heart of the Park

The area known as "The Heart of the Park" is located south of the main park entry on Hunters Point Boulevard to the isthmus that connects to "The Point." This area is presently designated in the CPSRA General Plan for native trees and shrubs with open grassy areas, trails parking, picnicking, fishing, windsurfing, park administration, and restroom facilities. Existing facilities include the main vehicular



Area 1: Grasslands South



Area 2: Bayview Gardens North

SOURCE: PBS&J, 2009.

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FIGURE III.P-4

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PHOTOGRAPHS OF EXISTING CPSRA – AREAS 1 AND 2



Area 3: The Last Rubble



Area 4: Wind Meadow

SOURCE: PBS&J, 2009.

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FIGURE III.P-5

Candlestick Point — Hunters Point Shipyard Phase II EIR

PHOTOGRAPHS OF EXISTING CPSRA – AREAS 3 AND 4



Area 5: Heart of the Park



Area 6: The Point

SOURCE: PBS&J, 2009.

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FIGURE III.P-6

Candlestick Point — Hunters Point Shipyard Phase II EIR

PHOTOGRAPHS OF EXISTING CPSRA – AREAS 5 AND 6



Area 7: The Neck



Area 8: Last Port

SOURCE: PBS&J, 2009.

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FIGURE III.P-7

Candlestick Point — Hunters Point Shipyard Phase II EIR

PHOTOGRAPHS OF EXISTING CPSRA – AREAS 7 AND 8



SOURCE: Google Earth Pro, basemap; PBS&J, 2009.

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AERIAL VIEW OF CPSRA WITHIN THE PROJECT SITE (EXCLUDING THE YOSEMITE SLOUGH)

FIGURE III.P-8

entrance and kiosk, parking lots, trails, three restrooms buildings, and group and family picnic areas. Landscape features include open meadow areas, berms planted with trees and shrubs, and a sandy beach. The Project proposes changes to the CPSRA boundary in this area to add approximately 1.5 acres of additional land. The Project would retain and enhance much of the existing landscape structure. Planting and overall aesthetics would be improved, pedestrian pathways would be renovated and added, and program areas would be developed for greater use. Improvements are proposed to existing restrooms, picnic areas, and trails. Additionally, new overlooks, an interpretive amphitheater, and reconfigured park entrance and parking facilities are proposed.

The Point

The area known as "The Point" is located at the end of the peninsula at the southeastern portion of the park. This area is presently designated in the CPSRA General Plan as a "quiet area" with native trees and shrubs and open grassy areas, trails, family picnic areas, a fishing pier, and a restroom building. The Project proposes to revitalize the existing site with improvements focused on pedestrian circulation, safety, and wayfinding; intensifying areas for increased use; improving the overall park aesthetics and landscape ecology; and reconnecting visitors to the bay shoreline. Native grasslands and shorelines would be restored and stabilized and new overlook points are proposed.

Wind Meadow

The area known as "The Phase 4 Area" in the CPSRA General Plan would become the "Wind Meadow" after the Project's proposed CPSRA boundary changes. It is presently designated in the CPSRA General Plan for native trees and shrubs with open grassy areas, trails, parking, picnicking, restrooms, and a Cultural Program Center. Additionally, a theater is designated to accommodate a wide variety of events such as dance, music, and theater. The CPSRA General Plan also describes children's play areas, a kitchen, and food concession for this area. Existing development in this area is limited to landscape features, such as sculptural earthwork and walls, trails, grassland and overlooks. This area is currently used for strolling, dog-walking, fishing, and bird watching and is the home of "Main Beach" (illustrated by Photo 1 in this section). Proposed features here would include new trails, restrooms, picnic areas, restored natural landscape areas, waterfront overlooks, and access to the water.

The Last Rubble

Until recently, the Last Rubble area was characterized by large piles of rubble and debris, remnants of the site's previous use as a dumping ground. The California Integrated Waste Management Board completed a rubble and debris removal project in April 2009. As a result of this, the majority of the rubble and debris was either removed or crushed on site. The Last Rubble area is designated in the CPSRA General Plan for native trees and shrubs with open grassy areas, trails, and overlooks. The area currently contains crushed concrete rubble, trails, and a mix of native and non-native grassland and shrubland (refer to Photo 2). The area is used for strolling, dog-walking, and bird-watching. The Project proposes changes to the CPSRA boundary in this area. It would be transformed into a new center for the CPSRA, with a wide variety of new program elements. The park ranger station/visitor's center would be located here, as well as a "Great Meadow" for passive recreational activities. In addition, The Last Rubble would contain a new beach area. Other features here may include parking, picnic areas, overlook terraces, restrooms, and a restaurant/café.

Bayview Gardens North

This area, which is also known as the "Boat Launch," is currently used for stadium parking. It would be transformed by the Project into "Bayview Gardens North." It is presently designated in the CPSRA General Plan for group camping, trails, native trees and shrubs with open grassy areas, and a boat dock for group camps. Currently, the Boat Launch area includes an unused boat ramp, parking lot, and restroom building. Landscape features here include shoreline with riprap and pockets of wetland vegetation. Located between the Bay and the proposed Bayview Gardens/Wedge Park, the Bayview Gardens North area would offer the greatest integration of urban and naturalized open spaces anywhere in the open space system and would provide strong visual gateway to the state parks and the Bay. Bio-swales, stormwater 'Eco-Gardens,' marshland (including potential salt-marsh restoration), new boardwalks, and overlook/fishing piers are central features of this area. Refer to Figure II-21 for the location of the new marshland.

Grasslands South

This area, which runs north along the shoreline from the Boat Launch to Arelious Walker Drive, is currently used for stadium parking and is not available as recreation or open space land. The Project would create grasslands and other habitats and make the area a functioning part of CPSRA's open space. is presently designated in the CPSRA General Plan for parking, park administration, trails, native trees and shrubs with open grassy areas, fishing, and a boat access facility. The boat access facility is described as a four-lane boat launching ramp, 200 car-boat trailer parking spaces, and a concession-operated boat service station. A protective breakwater with docking for ferryboats is also described. Currently, this area is undeveloped and is used as parking for the Candlestick Park stadium. Existing landscape features include shoreline with riprap and pockets of wetland vegetation. A boat ramp and associated parking and restroom facilities have been constructed to the southeast of this area. The Project proposes to reconfigure the boundary of this area and to improve it with trails, overlooks, native grasslands, meadow lawns, marshland, and earthworks shaped to provide shelter from the wind and enhance views. Site features could include overlooks, interpretive play areas, restrooms, overlook terraces, and parking. Refer to Figure II-21 for the location of the new marshland.

The Bay Trail

As briefly described in Section III.P.3 (Regulatory Framework) discussion, and more extensively described in Section III.B, the Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 400-mile network of bicycling and hiking trails. The Bay Trail would be incorporated into the design of new shoreline park facilities, such as the Waterfront Promenade, Heritage Park, Grasslands Ecology Park, and the CPSRA. It would tie together the entire waterside park system, providing clear connections to regional greenways and connections to waterways. The Bay Trail would encourage users from adjacent neighborhoods and other areas of San Francisco to utilize the new open spaces of the development and provide increased access to the shoreline. More specifically, the Project would include connections to the existing and new parks from the western boundary of Candlestick Point near the Harney Way/US-101 interchange, through the CPSRA, Yosemite Slough, and HPS Phase II shoreline to India Basin, connecting a gap in the Bay Trail that currently exists between the tip of the CPSRA to Indian Basin Flats. The footings for the Yosemite Slough bridge, under preliminary design, would cross the proposed extension of the Bay Trail under the Bay Trail Plan. Visitors utilizing the Bay Trail in the area of the bridge would be able to cross Arelious Walker Drive and pick up the Bay Trail on the other side of the bridge.

Other Parks and Open Space

- Boulevard Parks within the Project site. A hybrid of street and park, the Boulevard Park Streets bring broad fingers of green space into the urban neighborhoods, linking interior parks with bay-front parks. These streets have a strong pedestrian scale and quality, and serve as public 'front yards' for the neighborhoods. Broad landscaped medians or sidewalks (30-40' wide) are designed as mini-parks with garden seating areas. Boulevard Parks link the Alice Griffith and Central Candlestick communities with the CPSRA.
- Hillside Parks and Open Space within the Project site. The hillside parks and open space include the eastern 'tail' of Bayview Park and other hillside areas below Jamestown Road. The steeper areas and the flatter portion of Bayview Hill will be maintained in a more natural state.
- Yosemite Slough. While not located within the Project site except for the mouth of the slough, where the proposed bridge would be located, the Yosemite Slough is located directly adjacent to but outside of the Project site and is planned for restoration by the California State Parks and the California State Parks Foundation. The restoration will focus on providing new wetland habitat and environmental education opportunities. The proposed Yosemite Slough bridge would cross a small portion of the CPSRA on the southern side of the slough and pass along the edge of the eastern boundary of the CPSRA on the north side.

HPS Phase II

- Northside Park (12.8 acres), which would be located on the north shore of HPS Phase II, would offer a full suite of passive and active uses. The most active park uses are located at the southwestern portion of the park. This area includes community gardens, basketball, tennis, and volleyball courts and shade pavilion, children's playground, and restroom. The open-air African Marketplace would form an east-west promenade crossing the park, with looped pathways around the multi-use lawns providing additional multi-use space. To the northeast, the park takes on a more natural and passive character, with picnic/barbeque areas and shade shelters, and waterfront pathways.
- The Waterfront Promenade (29.5 acres) begins at the northern edge of the site and continues along the shoreline until terminating at the Waterfront Recreation Area described below. The promenade would provide evidence of the historic qualities of the industrial waterfront, which would be incorporated into tree bisques, seating areas, lawn panels, artworks, and interpretive gardens.
- Heritage Park (15.6 acres) would retain and reuse historic resources and materials as much as possible while utilizing modern design with industrial character. Children's play areas and areas of open lawn would be provided.
- Grasslands Ecology Park at Parcel E (44.9 acres) would contain native Eco-Gardens, passive lawns, native grasslands, windbreak groves, and landforms offering views of the bay and shoreline habitats. Site features could include group picnic areas, overlooks, a visitor/interpretive center, restrooms, and parking.

  Grasslands Ecology Park at E-2 (37.2 acres) would provide an open space area that includes picnic areas, grassy bird watching knolls, and overlooks. This passive recreation park would focus on views toward the Yosemite Slough Wetland Restoration area and provide opportunities for environmental education. The 44.9-acre Grasslands Ecology Park at Parcel E and the 37.2-acre Grasslands Ecology Park at Parcel E-2 on HPS Phase II are contiguous to CPSRA.
- The Sports Field Complex would include soccer/football, baseball, and volleyball fields, as well as warm-up fields, restrooms, and food concessions. The Sports Field Complex would be used for sporting events during day- and night-time hours. The surface of the fields would be seeded grass

above top soil with synthetic fibers and other base materials to support vehicle parking and tailgating for 49ers fans on game days. To prevent rutting and damage to the fields, the design will employ a fiber-reinforcement system that is incorporated into fast-draining, sandy soils.

- A Multi-Use Lawn area would provide event-day parking for events at the stadium. At other times, this large open space would provide for informal recreational activities, sporting, and other events as needed.

The Sports Field Complex and the Multi-Use Lawn both surround the proposed 49ers Stadium, providing parking for stadium-related events, as well as open space that would support a range of recreational activities, as described above. The surface of the fields would be seeded grass above top soil with synthetic fibers and other base materials to support vehicle parking.

- The Bay Trail would be incorporated into the design of the parks described above (refer to Figure III.P-2).
- The Waterfront Recreation Area would provide a flexible waterfront open space focused on small boat access could include education and interpretive facilities focused on San Francisco Bay.
- Boulevard Parks. A hybrid of street and park, the Boulevard Park Streets bring broad fingers of green space into the urban neighborhoods, linking interior parks with bay-front parks. These streets have a strong pedestrian scale and quality, and serve as public 'front yards' for the neighborhoods. Broad landscaped medians or sidewalks (30-40' wide) are designed as mini-parks with garden seating areas. Boulevard Park Streets connect the Hunters Point Hilltop community with Waterfront Park.
- Hillside Parks and Open Space Connection. A relatively small portion of the Hillside Park and Open Space located within HPS Phase II north of Crisp Road would provide a connection to the existing Hillside Parks and Open Space constructed in the Hunters Point Phase I project.
- Historic Landmark and Bay Naturalized Landscape. The landmark Re-Gunning Crane will be retained, providing a dramatic juxtaposition of the site's industrial history with the resurgence of nature at the Bay's edge. Trails and boardwalks would lead to overlook points providing visitors with opportunities to view Bay wildlife.

Overall, the Project would provide a substantial increase in the amount of developed, useable, high-quality parks, recreational facilities, and open space within the Project site. The Project would create a continuous network of interconnected recreational opportunities, promoting the use of the existing parks, such as the CPSRA, as well as the 239.7 acres of new parks, sports fields, and active urban recreation uses. The Project would provide a network of pedestrian and bike pathways that would connect Project uses to the adjacent neighborhoods and would ensure unrestricted public access to the parks and open space on the Project site and the Bay shoreline. Enhanced connectivity of on-site and off-site facilities and new neighborhood parks would allow integration of new and existing facilities into the citywide park network. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users to proposed "destination" parks, parks designed to accommodate regional demand. In addition, the Project would provide a continuous series of waterfront parks from the northernmost part of HPS Phase II to the southernmost part of Candlestick Point.

In addition, proposed recreational facilities, such as paved athletic courts, plazas, and picnic areas, would also support a large number of users within a relatively small area. Recreational facilities proposed for the Project site also include a Sports Field Complex that would provide soccer/football, baseball, and volleyball fields, as well as warm-up fields, restrooms, and food concessions. The parking area for the Sports Field

Complex would support parking during stadium events, but would be covered with specially engineered soils and turf to allow dual-use of the parking lot for athletic fields. Recreational facilities would also include a mix of active and passive areas of open lawns, dog runs, play areas, community gardens, and court games. Moreover, improved park facilities would provide a waterfront promenade, ecological open space areas, concessions, restrooms, and other uses that would allow the site to support a large service population.

Potential for Increase in Use of Parks

Overall, the Project would provide approximately 336 acres of new and/or improved park land and recreational facilities to accommodate the estimated build-out population of approximately 24,465 residents within the Project site, consisting of 239.7 acres of new parkland, sports fields, and active urban recreation uses, and 96.7 acres of existing and/or improved parkland.[986] As previously described, the new parks would include a variety of parks, including neighborhood parks, destination parks, boulevard parks, hillside parks and open space connections, waterfront parks, and improvements to the CPSRA. Parkland connectivity would be provided along the waterfront from the northernmost portion of HPS Phase II (at Northside Park) to the southernmost tip of Candlestick Point (at The Last Port of the CPSRA) (refer to Figure III.P-2), an amenity that is not provided today.

The increase in parkland would provide a ratio of about 13.7 acres of parkland per 1,000 residents within the Project site. Although this ratio is lower than the current ratio of 108 acres per 1,000 residents, it is substantially higher than the ratio of 5.5 acres per 1,000 residents identified in the City General Plan and used as a benchmark for this analysis.

The project would also provide approximately 10,730 jobs, which could result in a daytime population of 35,195 (adding the resident population of 24,465, and assuming that no residents were also employees, which is unlikely). Counting the entire daytime population as a part of the population served by the parks on the Project site, the parks-to-population ratio would be 9.5 acres per 1,000 employees/residents, which still exceeds the benchmark ratio of 5.5 acres per 1,000 residents.

Overall, the increase in the resident and daytime population of the Project site would not lead to substantial physical deterioration or degradation of existing facilities, nor would it result in the need for new or expanded facilities. The Project would, therefore, not cause a significant impact and no mitigation is required.

- Despite the availability of sufficient park acreage on the Project site, new residents or employees of the Project site may also choose to use existing parks outside of the Project site (refer to the Setting section for discussion of nearby parks), which could result in the deterioration or degradation of those existing resources. Similarly, it is possible that existing residents of the nearby area could also use parks, recreational facilities, and open space provided by the Project. Thus, this analysis considers the parkland-population ratio for the broader Bayview community, including the Project site and adjacent areas.

[986] As mentioned in the Setting section, there are approximately 203 acres of existing parkland at the Project site, consisting of 120.2 acres for the CPSRA and 83 acres for the stadium. The stadium is not included in any of the resident-to-parkland calculations as useable parkland.

According to the 2000 US Census, the population of the BVHP area in zip code 94124 was 33,170.[987] The boundaries of zip code 94124 are formed by Cesar Chavez Street to the north, US-101 to the west, the Bay to the east, and the southern tip of the CPSRA to the south. Adding the Project population of 24,465 and the Project employee population of 10,730 to the existing (2000) population for Bayview was added to yields a total of 68,365 people potentially using the parks in the area.

There are a total of 181.2 acres of additional park resources in zip code 94124. The major parklands in this zip code area include Gilman Park (4.6 acres), Bayview Park (44 acres), India Basin Shoreline Park (11.8 acres), the new parks and open spaces proposed for HPS Phase I (36 acres)988, Le Conte Avenue Mini-Park (0.5 acre), Heron's Head Park (24 acres), Hill Top Park (3.4 acres), Adam Rogers Park (2.8 acres), Shoreview Park (0.5 acre), Bayview Playground (4.6 acres), Ridgetop Plaza (0.3 acre), Youngblood-Coleman Playground (6.1 acres), the Joseph Lee Recreation Center (1.9 acres), the Palou-Phelps Mini-Park (0.3 acre), and the Silver Terrace Playground (6.1 acres). The combined total of the Project parks (336.4 acres) and the other parks within zip code 94124 (181.2 acres) would be 517.6 acres, resulting in a parks-to-population ratio of 7.6 acres per 1,000 population. This exceeds the benchmark ratio of 5.5 acres per 1,000 population. Therefore, the increase in the Project's resident and employee population and the existing area population would not lead to substantial physical deterioration or degradation of existing and proposed facilities, nor would it result in the need for new or expanded facilities. The Project would, therefore, not cause a significant impact and no mitigation is required.

Park Phasing

The timing of Project development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities.

The conceptual development plan described in Chapter II would result in the development of residential units and parks during all of four stages of development. Figure II-17 shows the particular residential and park areas that would be developed or improved in each phase. Table III.P-3 (Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland to be provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site. As this table indicates, at the end of each phase, the park-to-population ratio would be no lower than 13.8 acres per 1,000 residents. Table III.P-3a (Residential Units, Employment, and Park Acreage Provided during Each Stage of Development) identifies the resulting park-to-population ratio for residents and employees of the Project site. With the employee population added, the lowest park-to-population ratio at the end of a phase would be 9.6 acres per 1,000 residents/employees following the last stage of development.

[987] US Census Bureau American FactFinder, http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&Geo_id=&_geoContext (accessed on October 11, 2009).
[988] This park development is expected to be completed in 2012.

Table III.P-3 Residential Units and Park Acreage Provided during Each Stage of Development

Stage of Development	*Residential Units*	*Population*	*Total Parkland (ac)*	*Park-to-Population Ratio (acres per 1,000 Residents)*
Existing	256	1,113[a]	120.2	108
Phase 1	3,160	7,363[b]	235.6	32.0
Phase 2	5,165	12,035[b]	246.9	20.5
Phase 3	7,670	17,872[b]	250.4	14.0
Phase 4	10,500	24,465[b]	336.4	13.8

a. Refer to Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Housing, and Employment). This population correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.
b. Calculated as 2.33 people per residential unit.

Table III.P-3a Residential Units, Employment, and Park Acreage Provided during Each Stage of Development

Stage of Development	*Residential Units*	*Population*	*Total Parkland (ac)*	*Park-to-Population Ratio (acres per 1,000 Residents)*	*Employees*	*Park-to-Population Ratio (acres per 1,000 Residents & employees)*
Existing	256	1,113[a]	120.2	108	—	201.5
Phase 1	3,160	7,363	235.6	32.0	2,346	24.3
Phase 2	5,165	12,035	246.9	20.5	7,474	12.7
Phase 3	7,670	17,872	250.4	14.0	10,595	8.8
Phase 4	10,500	24,465[b]	336.4	13.8	10,730	9.6

a. Refer to Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Housing, and Employment). This population correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.
b. Calculated as 2.33 people per residential unit.

During a given phase, however, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual, and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed.

MM RE-2 *Phasing of parkland with respect to residential and/or employment-generating uses. Development of the Project and associated parkland shall proceed in four phases, as illustrated by Figure II-16 (Proposed Site Preparation Schedule) of Chapter II (Project Description) of this EIR. To ensure that within each phase parks and population increase substantially concurrently, development shall be scheduled such that adequate parkland is constructed and operational when residential and employment-generating uses are occupied. The following standards shall be met:*

- *No project development shall be granted a temporary certificate of occupancy if the City determines that the new population associated with that development would result in a parkland-to-population ratio within the Project site lower than 5.5 acres per 1,000 residents/population, as calculated by the Agency.*

- *For the purposes of this mitigation measure, in order for a park to be considered in the parkland-to-population ratio, the Agency must determine that within 12 months of the issuance of the temporary certificate of occupancy, it will be fully constructed and operational, and, if applicable, operation and maintenance funding will be provided to the Agency.*

Implementation of mitigation measure MM RE-2 would ensure that adequate parkland is provided as residential and employment-generating uses are constructed and occupied, and, at no time, shall the parkland-to-population ratio fall below 5.5 acres per 1,000 residents/population, as calculated by the City. Impacts related to parkland development with respect to development phasing would be less than significant.

Impact RE-3: Adverse Effects on Existing Recreational Facilities

Impact RE-3 **Implementation of the Project would decrease the size of CPSRA but would not, overall, have an adverse effect on the recreational opportunities offered by that park, nor would it substantially adversely affect windsurfing opportunities at the Project site. (Less than Significant)** ***[Criterion P.d]***

While the Project's reconfiguration of CPSRA would remove a net of 29.2 acres from the park, all of that acreage is degraded or unimproved (and not maintained) and does not provide substantial recreation opportunities to the community. Most of the land that would be removed from CPSRA is either currently used for stadium parking or is directly adjacent to Harney Way. The reconfiguration would add 5.7 acres of new parkland in The Last Port, The Neck, and The Heart of the Park, all areas that are currently developed and actively used that have high value as recreational resources. This additional acreage would widen the park at this important point, increasing its capacity for new users. Although there would be a net decrease in the total area of the CPSRA, that portion of the CPSRA that is currently developed and used for recreational purposes would be further expanded (by 5.7 acres) and improved.

Moreover, the Project would provide substantial improvements throughout the CPSRA. These improvements, which are described at length in the discussion of Impact RE-2, include revegetation and landscaping, shoreline restoration and stabilization, infrastructure improvements (such as trails, pathways, and visitor facilities), the provision of habitat and opportunities for environmental education, "Eco-Gardens," and salt-marsh restoration. The proposed Yosemite Slough bridge would cross a small portion of the CPSRA on the southern side of the slough and pass along the edge of the eastern boundary of the CPSRA on the north side. The area removed for bridge footings would impinge on approximately 300 feet or less (270 feet) through the CPSRA. On the south side, the bridge would extend Arelious Walker Drive through a portion of the CPSRA. Persons using the Bay Trail would be able to cross Arelious Walker Drive and easily access the opposite portion of the CPSRA. Thus, while the road and bridge approach on the south side of the slough would cross the CPSRA, it would not act as a physical barrier preventing use of the entire CPSRA. While the proposed road and bridge would cut through the open space in one location, the majority of the restored Slough area would remain unaffected and available for its intended use. Figure III.P-8 shows the existing unimproved and improved areas of the CPSRA and indicates where land would be removed or added relative to the existing CPSRA uses. These improvements would turn portions of the Park that are used for Candlestick Park stadium parking or are undeveloped and underutilized into functional parts of the CPSRA and of the Project's overall network of parks; see, for example, the descriptions above of The Last Rubble and The Wind Meadow. Currently improved parts of the CPSRA, such as The Heart of the Park, The Point, The Neck, and The Last Port, would also be improved. Overall, the reconfiguration and improvements would

enhance park aesthetics and landscape ecology; provide connections throughout the CPSRA and the other Project parks; and provide direct access to the Bay and the Bay shoreline for walking, swimming, fishing, kayaking, and windsurfing. The Project's proposed reconfiguration of the CPSRA therefore would not adversely affect the park's existing recreational facilities and opportunities.

The improvement and development of the CPSRA is expected to increase usage of CPSRA by visitors from outside the immediate Project vicinity (increased usage by the Project population and nearby residents is discussed above in Impact RE-2). While the number of additional visitors cannot be accurately predicted at this time, the Project's improvement will increase the amount of land at CPSRA that provides recreational opportunities (as discussed above), and will thus enable the park to accommodate the new demand. Moreover, the agreement between CDPR and the City or the Agency, providing for the reconfiguration of CPSRA, would also provide substantial funding for operation and maintenance of the park. This funding would further enable the park to accommodate increased demand.

Increased visitation to CPSRA would not significantly and adversely affect the park's existing recreational facilities and opportunities. A less-than-significant impact would occur, and no mitigation is required.

Windsurfing Analysis

As noted above, CPSRA is currently used by windsurfers as a launching point, and the Project proposes enhanced direct access for windsurfers. A Technical Memorandum for Wind Conditions (Technical Memorandum) was prepared for an adjacent development (Executive Park) to study the wind conditions at a windsurfing launch site at the CPSRA.[989] This document is included in Appendix P1. The Project was specifically considered in the Technical Memorandum as part of the cumulative development scenario that was analyzed for Executive Park. Wind direction is important in that an adverse direction can make it more difficult to launch, to reach a desirable sailing area, or to return to the launch site. Wind is necessary to launch and land, but if winds are too strong at the launch site, beginners and less-skilled windsurfers could find it difficult to do either.

There are no specific criteria for minimum or maximum wind speeds needed to support "good" windsurfing. If a project were to cause substantial wind speed reductions or increases over much of a major windsurfing area or at an irreplaceable launching or landing site, the utility of the CPSRA and Bay as an important windsurfing area could be affected.

The Technical Memorandum studied wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes the Project, generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). The Project would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

[989] Environmental Science Associates, *Potential Wind Conditions at Executive Park Development,* May 4, 2009.

Cumulative Impacts

The geographic context for an analysis of cumulative impacts to recreational resources is the City of San Francisco. The past and present development in San Francisco is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process, including the Yosemite Slough Restoration Project, Executive Park, Jamestown, Hunters Point Shipyard Phase I, Hunters View, and India Basin Shoreline, as well as additional growth in the City envisioned through 2030 (refer to analysis below).

The SFRPD maintain the City's parks, playgrounds, recreation centers, and open spaces throughout the City. The California Department of Parks and Recreation owns approximately 120.2 acres at CPSRA within the Project site. The National Park Service operates approximately 619 acres of parkland within the City as part of the Golden Gate National Recreation Area (GGNRA), including Alcatraz Island, Crissy Field, the Presidio, Fort Mason, and Ocean Beach.

The City's Recreation and Park Acquisition Policy recognizes that the localized neighborhood service populations' need for parks and recreational facilities vary based on demographic characteristics. The cumulative projects in San Francisco could include recreational facilities or would be required to improve or expand existing recreational facilities. Any potential impacts resulting from the construction or improvement of new or existing park and open space facilities provided by cumulative development would be specific to the particular project being constructed, its local context, and the specific construction impact. For example, the Recreation and Park Acquisition Policy includes a criterion that land purchased by the SFRPD that has a record of hazardous or toxic contamination must by fully remediated by the seller prior to acquisition. The Department of Toxic Substances Control has adopted a similar policy requiring land covenants at hazardous materials sites prior to redevelopment of those sites for recreational and other uses. Additional mitigation measures would likely be required to reduce construction-related significant impacts to air quality, traffic, noise, or other affected environmental resources resulting from construction of cumulative recreational facilities. As noted, above, construction activities associated with the proposed parks and recreational facilities of the Project would be temporary and, further, mitigation measures are identified in this EIR to reduce significant impacts, although not always to a less-than-significant level. A discussion of cumulative project-related construction impacts, including those associated with the construction of parks and recreational facilities is provided in the applicable sections of this EIR. (Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the cumulative analysis and conclusions.)

Development of cumulative projects, but not the Project, would result in the increased use of existing neighborhood and regional parks and other recreational facilities by the total estimated City population of 892,335 persons in 2030 (refer to Section III.C).[990] If no new parks or recreational facilities were built in

[990] As discussed in Section III.C (Population, Employment, and Housing), the City recently developed citywide planning projections that would capture Citywide growth expected by 2030 considering the ABAG Projections 2009 target, but also taking into account local knowledge of projects currently in various stages of the entitlement process. Specifically, the 2030 population projection of 916,800 included the Project and two other large development programs currently undergoing environmental review (Treasure Island and Park Merced). To determine the 2030 population in the absence of the Project, this analysis subtracts the Project population of 24,465 from that projection.

San Francisco by 2030 and the inventory were to remain at approximately 5,886 acres[991] the ratio of acres of parkland per 1,000 residents would be approximately 6.6 acres.

At full build-out, the Project would increase the City's inventory of parkland to 5,989.2 acres[992], and its population to 916,800. The City's parkland-to-population ratio would remain approximately 6.6 acres per 1,000 residents. This is greater than the benchmark of 5.5 parkland acres per 1,000 population. In light of the Project's improvements, the City's stock of high-quality recreation land would be substantially increased, even as its parkland-to-population ratio remains the same.

Because there would be sufficient parkland and open space to adequately serve the projected City population in 2030 (including the Project and other growth envisioned by the City), even without the development of new parks and open space proposed by the Project, there is no significant impact to recreation as a result of development of the cumulative projects. Therefore, there is no cumulative impact to which the Project could contribute.

Refer to Section III.G (Wind) for a discussion of cumulative wind impacts.

[991] This assumption is conservative in that it is highly unlikely that there would be no additional development of parkland in the City. Future developments such as Treasure Island and Park Merced will be required to provide substantial amounts of parkland.

[992] The total of 6,102.2 acres of parkland consists of 5,886 acres of existing parkland (including the 120.2 acres of the CPSRA) plus the 216.2 new parkland acres provided by the Project. This figure assumes that the Project's new parkland is the only new parkland in the City between now and 2030. As explained above, that is very unlikely. The actual parkland-to-population ratio in 2030 is likely to be substantially higher than the 6.5 reported here.

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SECTION III.Q UTILITIES

III.Q.1 Introduction

This section evaluates the effects on utilities and service systems related to implementation of the Project by identifying anticipated demand and existing and planned utility availability. For purposes of this EIR, utilities include water supply, wastewater conveyance and treatment, and solid waste collection and disposal. Stormwater[993] is discussed in Section III.M (Hydrology and Water Quality). The impacts of the Project related to electricity and natural gas demand and consumption are analyzed in Section III.R (Energy). This section analyzes electricity, natural gas, and telecommunications infrastructure relative to their ability to serve the Project site. This section identifies both Project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid the identified impacts. The baseline conditions used in this analysis are identified under each utility discussion.

Data used to prepare this section include information obtained from the San Francisco Public Utilities Commission (SFPUC), the California Integrated Waste Management Board (CIWMB), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and other regulatory agencies and service providers. Water demand was estimated in the *Water Supply Assessment for the Proposed Candlestick Point–Hunters Point Shipyard Phase II Project* (WSA) prepared by PBS&J for the SFPUC, included as Appendix Q1 (Water Supply Assessment). Additional information was obtained from several studies prepared on behalf of Lennar Urban, including the *Candlestick Point/Hunters Point Shipyard Infrastructure Concept Report* (2007) prepared by Winzler & Kelly Consulting Engineers; the *Low Impact Development Analysis* (2008) prepared by Winzler & Kelly; the *LID Stormwater Opportunity Study* (2009) prepared by Arup; the *Revised Water Demand Memorandum* dated October 15, 2009, and April 28, 2010,[994] by Arup, included as Appendix Q2 (Arup, Amendment to Water Demand Memorandum #16—Variant 2A [Housing/R&D Variant], April 28, 2010); Technical Memorandum from Hydroconsult Engineers dated October 2009 (Appendix Q3 [Technical Memorandum from Hydroconsult Engineers]); and the *CPHPS Infrastructure Plan* (October 2009) prepared by Winzler & Kelly and Arup.

Water

III.Q.2 Setting

Regional Water System

The Project site is served by the San Francisco Public Utilities Commission, which manages a complex Regional Water System (RWS), stretching from the Sierra Nevada Mountains to San Francisco Bay Area and serving 2.5 million residential, commercial, and industrial customers in the Bay Area and Sierra Nevada

[993] One threshold provided under the Utilities and Service Systems section of Appendix G of the CEQA Guidelines specifically relates to stormwater (Criterion XIV(c)); this threshold is addressed in Section III.M (Hydrology and Water Quality) of this EIR.
[994] An April 28, 2010, Addendum to the Water Demand Memorandum #16—Variant 2A (Housing/R&D Variant) (dated October 15, 2009) is included as Appendix Q2 of this C&R document.

foothills.[995] The RWS can be thought of as consisting of three integrated water supply and conveyance systems: Hetch Hetchy, Alameda, and the Peninsula systems.

The RWS provides wholesale water service to twenty-seven Bay Area water agencies located in Alameda, San Mateo, and Santa Clara Counties (wholesale customers), and also provides retail water for the residents, businesses, and industries within the municipal boundaries of the City and County of San Francisco (retail customers). In addition, the retail customers also include San Francisco International Airport and San Francisco County Jail in San Mateo County, the unincorporated Town of Sunol, Lawrence Livermore Laboratory, Castlewood development in Alameda County, and Groveland Community Services District in Tuolumne County.

Auxiliary Water Supply System

The Auxiliary Water Supply System (AWSS) is a separate and distinct water supply system for fire protection purposes only. Candlestick Point and HPS Phase II are not currently served by the AWSS. Currently, there is a planned extension of the AWSS on Gilman Street from Ingalls Street to Candlestick Point. The Project would connect to this extension and provide an AWSS loop within Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road.

Sources of Water Supply

In Fiscal Year 2007/08 the RWS delivered an annual average of approximately 256.7 million gallons[996] of water per day (mgd), with approximately 85 percent of that water supply provided by the Hetch Hetchy system, which diverts water from the Tuolumne River. The balance (of approximately 15 percent[997]) comes from runoff in the Alameda Creek watershed, which is stored in the Calaveras and San Antonio reservoirs, and runoff from the San Francisco Peninsula, which is stored in the Crystal Springs, San Andreas, and Pilarcitos reservoirs (which also provide storage for water delivered from the Alameda and Hetch Hetchy systems). A small portion of retail demand is met through locally produced groundwater, used primarily for irrigation at local parks and on highway medians, and recycled water, which is used for wastewater treatment process water, sewer box flushing, and similar wash down operations. The SFPUC also retails groundwater (pumped from the Pleasanton well field) to the Castlewood development in Alameda County.

Water Supply Reliability Planning

To enhance the reliability of the RWS, improve dry-year supplies, diversify the water supply portfolio, and meet projected wholesale and retail demand through 2030, the SFPUC developed the Water Supply Improvement Program (WSIP), approved on February 28, 2005. Under the WSIP as originally developed, the SFPUC proposed to meet projected 2030 average daily purchase requests of 300 mgd in the RWS service area by increasing diversions from the Tuolumne River under its existing water rights and

[995] City and County of San Francisco, Public Utilities Commission (SFPUC) website, http://www.sfgov.org/site/frame.asp?u=http://www.sfwater.org/ accessed August 16, 2009.
[996] PBS&J, Water Supply Availability Study of City and County of San Francisco, October, 2009.
[997] Ibid.

developing 10 mgd of new local resources through a combination of additional conservation, water recycling and groundwater supply programs.[998] The WSIP proposed various water facility improvement projects to achieve stated public health, seismic safety, delivery reliability and water supply goals. The WSIP also included provisions for obtaining additional dry-year supplies. The Program Environmental Impact Report (PEIR) for the WSIP identified and analyzed potential impacts that would result from implementation of the WSIP, including the diversion of an additional 35 mgd annual average from the Tuolumne River, along with 3 variants and 6 alternatives, including various water supply combinations that could meet future demand. Impacts associated with the water supply decisions were analyzed at a project-level of detail. All facility projects, including construction of projects to implement proposed local water supply projects were analyzed at a program-level of detail. After certification of the FPEIR by the Planning Commission, on October 30, 2008, the SFPUC adopted a Phased WSIP option, which included the following program elements: (1) full implementation of all WSIP facility improvement projects; (2) water supply delivery to RWS customers through 2018 with an average annual target delivery of 265 mgd originating from the watersheds. This includes 184 mgd for wholesale customers and 81 mgd for retail customers; (3) water supply sources consisting of 265 mgd average annual from SFPUC watersheds, 10 mgd conservation, recycled water, and groundwater in San Francisco and 10 mgd conservation, recycled water, and groundwater in the wholesale service area; (4) dry-year water transfers coupled with the Westside Groundwater Basin Conjunctive Use project to ensure drought reliability; (5) re-evaluation of 2030 demand projections, RWS purchase requests and water supply options by 2018 and a separate SFPUC decision by 2018 regarding water deliveries after 2018; and (6) provision in the new Water Supply Agreement between the SFPUC and wholesale customers to impose financial penalties to limit water sales to an average annual 265 mgd from the SFPUC watersheds through 2018 (SFPUC Resolution No. 08-0200, October 30, 2008). Thus, under the Phased WSIP, SFPUC has voluntarily chosen to limit deliveries from the RWS surface water supplies, and by December 31, 2018, the SFPUC will reevaluate water demands and water supply options through 2030 in the context of then-current information.

The Phased WSIP would meet projected 2018 demand of approximately 285 mgd by capping deliveries from the RWS at 265 mgd, with 184 mgd allocated to wholesale customers and 81 mgd allocated to retail customers[999]. The remaining 20 mgd of demand would be met through water conservation, recycling and groundwater, with 10 mgd provided by wholesale customers and 10 mgd provided by local projects within San Francisco. Improved dry-year supplies would be provided via implementation of the Westside Groundwater Basin Conjunctive Use Project (in San Mateo County), and less than 2 mgd in water transfers. The 10 mgd of local supply committed to by the SFPUC upon adoption of the Phased WSIP would be provided through development of the local water supply improvements discussed below.

Local Water Supply Improvements

Groundwater

Early in its history, San Francisco made significant use of local groundwater, springs, and spring-fed surface water and in the 1930s pumping rates from the groundwater basin on the west side of the City were reported to be up to a total of 6 mgd. However, after the development of surface water supplies in the

[998] SFPUC, *Water Supply Improvement Program*, February 28, 2005.
[999] PBS&J, Water Supply Availability Study of City and County of San Francisco, October, 2009.[999] Ibid.

Peninsula and Alameda watersheds and the subsequent completion of the Hetch Hetchy system in the 1930s, the use of groundwater for the water supply system has been minimal.[1000]

San Francisco overlies all or part of seven groundwater basins, including the Lobos, Marina, Downtown, and South basins, located wholly within the City limits, and the Islais Valley, South, and Visitation Valley basins that extend south into San Mateo County. The portion of the Westside Basin aquifer located within San Francisco is commonly referred to as the North Westside Basin. Except for the Westside and Lobos basins, groundwater in the other basins is insufficient for municipal supply due to low yield[1001]. Local groundwater is used for irrigation purposes in some parks, as well as non-potable purposes at the San Francisco Zoo and Golden Gate Park.

SFPUC is currently studying implementation of the San Francisco Groundwater Supply Project (SFGSP), created as part of the WSIP, to expand use of the local ground water source to provide ongoing supply and to improve reliability during drought, maintenance conditions, earthquake, or other emergency. The SFGSP proposes the construction of up to six wells and associated facilities in the western part of San Francisco to extract up to 4 mgd of water from the North Westside Groundwater Basin for distribution in the City. The extracted groundwater would be treated, disinfected, and blended in small quantities with surface water supplies before entering the municipal drinking water system. The environmental review for this project is expected to begin in November 2009.

Recycled Water

From 1932 to 1981, San Francisco's McQueen Treatment Plant provided recycled water to Golden Gate Park for irrigation purposes. Due to regulatory changes, the City closed the McQueen plant and discontinued use of recycled water in Golden Gate Park. Currently, disinfected secondary-treated recycled water from the SFPUC's Southeast Water Pollution Control Plant is used on a limited basis for wash-down operations in the Combined Sewer Systems and is also provided to construction contractors for dust control and other construction purposes. Current use of recycled water for these purposes in San Francisco is less than 1 mgd.[1002]

In March 2006, the SFPUC updated the Recycled Water Master Plan (RWMP) for the City. The 2006 RWMP identified where and how San Francisco could most feasibly develop recycled water in the City and provided strategies for implementing the recycled water projects that were identified. The SFPUC plans to continue to diversify San Francisco's water supply portfolio by increasing the use of local water sources, such as recycled water, groundwater, water conservation, and desalination.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects. The proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco. Recycled water will primarily be used for landscape irrigation, toilet flushing, and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project is expected to begin environmental review in late 2009 or early 2010. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project.

[1000] SFPUC, *2005 Urban Water Management Plan for the City and County of San Francisco*, December 2005.[1000] UWMP 2005.
[1001] PBS&J, Water Supply Availability Study of City and County of San Francisco, October, 2009.[1001] Ibid.
[1002] Ibid.

The Westside Recycled Water Project would provide recycled water to several sites on the west side of San Francisco. The system would produce recycled water at a proposed recycled water treatment facility in Golden Gate Park and deliver the water to the San Francisco Zoo, Golden Gate Park, and Lincoln Park Golf Course for landscape irrigation and for non-potable uses at the Zoo and Golden Gate Park, including at the California Academy of Sciences. SFPUC has begun the project-specific environmental review for this project.

In addition, the SFPUC has partnered with the North San Mateo County Sanitation District (NSMCSD) to propose the Harding Park Recycled Water Project, which would use recycled water from the NSMCSD located in Daly City, to irrigate the Harding Park and Fleming Park golf courses in San Francisco. Completion of these projects are anticipated by the end of 2013 and would produce 2 million gallons of recycled water to irrigate Golden Gate Park, Fleming and Lincoln golf courses, Harding Park, and the San Francisco Zoo, along with commercial customers. Daly City is expected to complete the project-specific environmental review for the Harding Park Recycled Water Project in 2009. Currently, the SFPUC is conducting a recycled water demand assessment on the Eastside of San Francisco. The assessment examines the potential uses of recycled water for irrigation, toilet flushing, and commercial applications.

Water Conservation

The SFPUC's demand management programs range from financial incentives for plumbing devices to improvements in the distribution efficiency of the system. The conservation programs implemented by the SFPUC are based on the California Urban Water Conservation Council's list of fourteen Best Management Practices (BMP) identified by signatories of the Memorandum of Understanding Regarding Urban Water Conservation in California, executed in 1991. Refer to the WSA (Appendix Q1) for an assessment of BMP progress to date.

In addition, the SFPUC is increasing its water conservation programs in an effort to achieve new water savings by 2018, consistent with the Phased WSIP. This program is based on the 2004 San Francisco Retail Water Demands and Conservation Potential report[1003] (Demand Report) that identified potential water savings and implementation costs associated with a number of water conservation measures. These new conservation programs include high-efficiency toilet replacement in low-income communities and water efficient irrigation systems in municipal parks. With this expanded conservation program, the SFPUC anticipates reducing gross per household consumption (which includes both residents and non-residents) from 91.5 gallons per day (gpd) to 87.4 gpd by 2018, which would result in a conservation supply potential of approximately 4.0 mgd annually.

Water Treatment Capacity

Water from the Hetch Hetchy system is delivered to customers without filtration since the quality of this water supply has warranted a filtration exemption.[1004] Water from the Alameda system is treated at the Sunol Valley

[1003] Hannaford and Hydroconsult, City and County of San Francisco Retail Water Demands and Conservation Potential, 2004.

[1004] Current regulations providing for a filtration exemption under the Safe Drinking water Act are found in Surface Water Treatment Rule (54 FR 27486, June 29, 1989), as amended by the Long Term 1 Surface Water Treatment Rule (67 FR 1812, January 14, 2002) and the Long Term 2 Surface Water Treatment Rule (71 FR 654, January 5, 2006). EPA granted a filtration exemption to SFPUC in September 1993.

Water Treatment Plant (WTP). Peninsula system water and any Hetch Hetchy or Alameda system water stored in Peninsula reservoirs is treated at the Harry Tracy WTP. These treatment plants have existing treatment capacities of 160 mgd and 120 mgd, respectively. To ensure treatment capacity into the future, the SFPUC is currently completing the environmental review of a proposal to upgrade the Sunol Valley WTP to reliably treat 160 mgd and increase the storage capacity of treated water at the Sunol Valley WTP. The Sunol Valley Water Treatment Plant (SVWTP) Expansion and Treated Water Reservoir project is located in an unincorporated portion of Alameda County in the Sunol Valley within the SFPUC's Alameda watershed. The SFPUC is also currently designing an expansion of the Harry Tracy WTP to reliably deliver 160 mgd, which would increase the total treatment capacity of the RWS to 320 mgd. The Harry Tracy WTP, located in unincorporated San Mateo County, California, near the Cities of San Bruno and Millbrae, proposes improvements including improving water quality, increasing water delivery capability, and strengthening facilities with seismic upgrades. These projects would further the delivery reliability goals identified by the SFPUC as part of the Phased WSIP by allowing the SFPUC to deliver water to meet winter demands during maintenance and emergency supply in the event of loss of the Hetch Hetchy system supply. In addition, SFPUC has initiated construction of the Tesla advanced disinfection treatment facility in Tracy, California, to provide advanced disinfection of water from the Hetch Hetchy system. When completed in 2011, the Tesla advanced disinfection treatment facility would be the nation's largest ultraviolet disinfection treatment plant.

Water Shortage and Dry-Year Planning

Prior to the late 1970s, droughts did not seriously affect the ability of the SFPUC to sustain full deliveries to its customers. However, as the 1987-1992 drought progressed and reservoir storage continued to decline, it became apparent that continued full deliveries could not be sustained. To provide some level of assurance that water could be delivered continuously throughout a drought (although at reduced levels), the SFPUC subsequently adopted a drought planning sequence and associated operating procedures that trigger different levels of water delivery reductions relative to the volume of water stored in SFPUC reservoirs.

Each year, during the snowmelt period, the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS. If this evaluation finds the projected total water storage to be less than a level sufficient to provide sustained deliveries, the SFPUC may impose delivery reductions or rationing. The amount of the reduction is specified in contractual agreements between the SFPUC and wholesale customers, as detailed in the existing Water Shortage Allocation Plan (WSAP). The WSAP provides specific allocations of available water between the retail and wholesale customers associated with different levels of systemwide shortages. For retail customers, the provisions of shortage allocations are identified in the Retail Water Shortage Allocation Plan (RWSAP). Under the RWSAP, during a shortage of between 5 to 10 percent (Stage 1), SFPUC retail customers would experience no reduction in deliveries, but the SFPUC would issue a voluntary rationing request to customers, alert customers to water supply conditions, remind them of existing water use prohibitions, and provide education on, and possible acceleration of, incentive programs. For a shortage of between 10 to 20 percent (Stage 2), retail customers would experience a 1.9 percent reduction in retail deliveries. During Stage 2, all Stage 1 measures would be implemented, customers would receive a specific allotment of water, and if a customer's water use goes above their allotment, they would be subject to an excess use flow restrictor device and shut-off of water. For shortages in excess of 20 percent (Stage 3), all Stage 2 measures are implemented and additional reductions in retail allotments would be implemented, as determined by the SFPUC.

Current and Future Water Supplies

As discussed above, the Phased WSIP allocates 81 mgd to retail customers. In addition, approximately 3.5 mgd of groundwater is provided from local groundwater basins (to San Francisco parks, the San Francisco Zoo, Golden Gate Park, and Castlewood). Per the Phased WSIP, an additional 10 mgd would be provided from local groundwater and recycled water projects and from conservation measures that reduce demand. Table III.Q-1 (SFPUC Estimated Retail Water Supplies, 2010–2030) provides an estimate of retail water supplies between 2010 through 2030, which projects an increase from 84.5 mgd to 94.5 mgd.

Table III.Q-1 SFPUC Estimated Retail Water Supplies, 2010–2030

Water Supply Sources	*2010*	*2015*	*2020*	*2025*	*2030*
Current Water Supply Sources					
SFPUC RWS (Surface water: Tuolumne River, Alameda & Peninsula)[a]	81.0	81.0	81.0	81.0	81.0
Groundwater Sources					
Groundwater (In-City Irrigation Purposes)	2.5[b]	0.5[c]	0.5[c]	0.5[c]	0.5[c]
Groundwater at Castlewood[d]	1.0[d]	1.0[d]	1.0[d]	1.0[d]	1.0[d]
Groundwater: Treated for Potable—Previously used for In-City Irrigation purposes[e]	0.0	2.0	2.0	2.0	2.0
Groundwater Subtotal	*3.5*	*3.5*	*3.5*	*3.5*	*3.5*
Current Water Supply Subtotal	*84.5*	*84.5*	*84.5*	*84.5*	*84.5*
WSIP Water Supply Sources					
Groundwater Development: Potable from SF GWSP (Westside Groundwater Basin)[f]	0.0	2.0	2.0	2.0	2.0
Recycled Water Expansion Irrigation[g]	0.0	4.0	4.0	4.0	4.0
Supply Conservation Program	0.0	4.0	4.0	4.0	4.0
WSIP Supply Subtotal	*0.0*	*10.0*	*10.0*	*10.0*	*10.0*
Total Retail Supply (Current and WSIP Supplies)	***84.5***	***94.5***	***94.5***	***94.5***	***94.5***

SOURCE: PBS&J, *Water Supply Assessment for the Proposed Candlestick Point—Hunters Point Shipyard Phase II Project*, October, 2009.

a. RWS surface water supplies are subject to reductions due to below-normal precipitation. This may affect dry-year supplies—model shows supply reduction occurs in year 2 of multiple-dry-year event (Source: SFPUC 2008 WSIP Phase Variant Supply limitation).
b. Groundwater serves irrigation to Golden Gate Park, SF Zoo, and Great Highway Median.
c. A Groundwater reserve of 0.5 mgd for irrigation purposes would remain as part of SFPUC's non-potable groundwater supply.
d. Castlewood current and projected use remains unchanged over 20-year planning horizon.
e. 2.0 mgd of groundwater treated and blended for Potable water supply purposes.
f. 2.0 mgd of new groundwater developed as part of the new local supply target.
g. 2.0 mgd of Recycled used for irrigation at Golden Gate Park, SF Zoo, Great Highway Median, and 2.0 mgd for other non-potable purposes.

Current and Future Water Demand

To update the water supply and demand estimates provided in the 2005 update of the Urban Water Management Plan (UWMP), the SFPUC developed a Water Supply Availability Study (WSAS, included as an attachment to Appendix Q1). The WSAS incorporates new water supply information (per the Phased WSIP) and generates new estimates of future water demand for San Francisco. The future water demand estimates are based on the most current population and employment estimates, which include the Project and other major development proposals not anticipated in the 2005 UWMP.

The new demand estimates also incorporate the results of the 2004 Demand Report, which analyzed water demands associated with each retail customer sector and included development of a water use model. The water use model accounts for demand at the end use level (such as individual toilets and showers), and established water use rates for specific units, including multi-family residential households and employees, the latter of which is used to estimate non-residential water demands. The WSAS used an average of these water use rates over the next 20 years (2010–2030) to establish a water use rate for multi-family residential households of 98.7 gpd, and a water use rate for employees of 42.42 gpd. With these unit rates, future water demand can be estimated from changes in the number of residential households and/or employees in San Francisco.

To update future water demand, the WSAS compared the estimates of residential households and employees used in the 2005 UWMP with new population and employment forecasts provided by the San Francisco Planning Department,[1005] which were designed to closely match the recently adopted Association of Bay Area Governments (ABAG) Projections 2009 target, and taking into account local knowledge of projects currently in various stages of the entitlement process. Updated water demand estimates were then generated, which included the increment of future growth that was not previously included in the 2005 UWMP estimates.

Estimates of water demand for major development proposals in San Francisco were based on information provided by project proponents (including Lennar Urban for the Project). The water demand estimates were independently reviewed by PBS&J and the SFPUC as part of the WSAS and the Water Supply Assessment (WSA) prepared for the Project and determined to be consistent with the demand rates developed for the 2004 Demand Report.[1006]

Table III.Q-2 (Estimated Average Annual Retail Water Demand) provides an estimate of total SFPUC Retail Water Demands from 2010 through 2030, which incorporates the most recent new residential development estimates from 2015 through 2030, and assumes some development not previously included in the 2005 UWMP estimates. Total retail water demand, including Project demand, is estimated to increase from 91.81 mgd in 2010 to approximately 93.42 mgd by 2030.

To assess the adequacy of current and projected future water supplies to meet estimated future demand, including the demand associated with major development proposals, including the Project, and other projected future growth (e.g., background growth from ABAG projections), the WSA included a comparison of retail water supply and demand. Table III.Q-3 (Comparison of Projected Water Supply and Demand for Normal, Single Dry, and Multiple Dry Years [mgd]) provides a comparison of the projected future retail water supply and demand in varying hydrologic conditions over the 20-year planning horizon through 2030.

[1005] San Francisco Planning Department, Projections of Growth by 2030, July 9, 2009 (included as Appendix A to the Water Supply Availability Study).
[1006] PBS&J, *Water Supply Assessment for the Proposed Candlestick Point—Hunters Point Shipyard Phase II Project*, October 2009.

Table III.Q-2 SFPUC Estimated Average Annual Retail Water Demand

Users, Facilities, and Entities		*Projected Water Demand (mgd)* 2010	2015	2020	2025	2030
Residential Demand (Single and Multiple Family)[a]		44.70	43.80	43.20	42.90	42.90
New Residential Demand generated by Projects and Incremental Growth[b,d]		—	0.47	0.95	1.42	1.89
	Subtotal	*44.70*	*44.27*	*44.15*	*44.32*	*44.79*
Non-Residential - Business/Industrial Demands[c,d]		30.21	30.52	30.83	31.14	31.73
	Subtotal	*74.91*	*74.79*	*74.98[i]*	*75.46*	*76.52*
Unaccounted-for System Losses		7.30	7.30	7.30	7.30	7.30
	Subtotal	*82.21*	*82.09*	*82.28*	*82.76*	*83.82*
Other Retail Demands[e]		4.90	4.90	4.90	4.90	4.90
Lawrence Livermore Laboratory; Groveland CSD[f]		1.20	1.20	1.20	1.20	1.20
City Irrigation Demand[g]		2.5	2.5	2.5	2.5	2.5
Castlewood Community Demand[h]		1.0	1.0	1.0	1.0	1.0
	Total Retail Demand	***91.81***	***91.69***	***91.88[i]***	***92.36***	***93.42***

SOURCE: PBS&J, Water Supply Assessment for the proposed Candlestick Point/Hunters Point Shipyard Phase II project, October, 2009.

a. Residential Demands
b. Multiple Family Demand calculated as [2030 Incremental Growth of 0.24 mgd + (CP-HPS II 10,500 DU) 1.04 mgd + (TI-YBI 8,000 DU) 1.17 mgd + (Park Merced 8,900 total DU) 0.94 mgd = 3.40 mgd. With existing demand of 1.51 mgd at all three sites, net demand is (3.40 mgd – 1.51) 1.89 mgd.
c. Agriculture, Mining, Construction, Manufacturing, Transportation, Wholesale & Retail Trade, F.I.R.E., Services, Gov't including Builders – Contractors and Docks – Shipping, per 2009 ABAG Employment Projections updated dated from SF Planning (July 2009) Employment water demands calculated 42.42 gallons per employee per day.
d. Non-residential (jobs/employment) demands at major project sites were assumed to be contained in the 2009 ABAG Employment projections. Growth in demand is incrementally increased to reflect the growth in jobs over the 20-year planning horizon. To avoid double-counting the water demand associated with the 2009 SF Planning Non-Residential Employment Projections and the non-residential demand calculated in the developer estimates at each of the Project sites, the total water demand at each of the developments was adjusted to remove the non-residential demands. This study assumes all non-residential demand is accounted for in the 2009 SF Planning Non-Residential Employment Projections. Net change in water demand at the Project sites and the adjusted change in water demand without non-residential demand.
e. US Navy, SF International Airport, and other suburban/municipal accounts.
f. Lawrence Livermore Laboratories (0.8 mgd); Groveland CSD (0.4 mgd)
g. City Irrigation at Golden Gate Park, Great Highway Median and SF Zoo.
h. Castlewood Community demand served by wells in the Pleasanton well field.
i. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals; this table is consistent with Table 4-7 of the WSA.

Table III.Q-3 Comparison of Projected Supply and Demand for Normal, Single Dry, and Multiple Dry Years (mgd)

				Multiple Dry Year Event		
	Retail Supply and Demand	***Normal Year***	***Single Dry Year***	***Year 1***	***Year 2***	***Year 3***
2010	RWS Supply[a]	81.00	81.00	81.00	79.50	79.50
	Groundwater Supply[b]	3.50	3.50	3.50	3.50	3.50
	Total Retail Supply[c]	***84.50***	***84.50***	***84.50***	***83.00***	***83.00***
	Total Retail Demand[d]	91.81	91.81	91.81	91.81	91.81
	Surplus/(Deficit)[e]	-7.31	-7.31	-7.31	-8.81	-8.81
2015	RWS Supply[a]	81.00	81.00	81.00	79.50	79.50
	Groundwater[f]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[g]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[c]	***94.50***	***94.50***	***94.50***	***93.00***	***93.00***
	Total Retail Demand[d]	91.69	91.69	91.69	91.69	91.69
	Surplus/(Deficit)	2.81	2.81	2.81	1.31	1.31
2020	RWS Supply[a]	81.00	81.00	81.00	79.50	79.50
	Groundwater[f]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[g]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[c]	***94.50***	***94.50***	***94.50***	***93.00***	***93.00***
	Total Retail Demand[d]	91.87	91.87	91.87	91.87	91.87
	Surplus/(Deficit)	2.63	2.63	2.63	1.13	1.13
2025	RWS Supply[a]	81.00	81.00	81.00	79.50	79.50
	Groundwater[f]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[g]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[c]	***94.50***	***94.50***	***94.50***	***93.00***	***93.00***
	Total Retail Demand[d]	92.36	92.36	92.36	92.36	92.36
	Surplus/(Deficit)	2.14	2.14	2.14	0.64	0.64
2030	RWS Supply[a]	81.00	81.00	81.00	79.50	79.50
	Groundwater[f]	3.50	3.50	3.50	3.50	3.50
	WSIP Supply Sources[g]	10.00	10.00	10.00	10.00	10.00
	Total City Supply[c]	***94.50***	***94.50***	***94.50***	***93.00***	***93.00***
	Total Retail Demand[d]	93.42	93.42	93.42	93.42	93.42
	Surplus/(Deficit)	1.08	1.08	1.08	-0.42[h]	-0.42[h]

SOURCE: PBS&J, Water Supply Assessment for the proposed Candlestick Point/Hunters Point Shipyard Phase II project, October, 2009.

a. RWS Supply SFPUC Water Supplies
b. Groundwater Uses for In-City Irrigation and Castlewood.
c. Total Retail Supply from SFPUC Water Supplies
d. SFPUC Retail Demand
e. The deficit shown in 2010 is the result of reducing the RWS supply to 81 mgd as per the Phased WSIP Variant, without full development of the additional 10 mgd of new supplies. 10 mgd of new sources would be developed and available for use in SF by 2015. However, SF Retail demand is currently lower than projected (FY07/08 use was 83.9 mgd). If SF Retail demands exceed the available supply of 84.5 mgd between 2010 and 2015, the Water Supply Agreement allows the SFPUC to purchase additional water from the RWS. If combined Retail and wholesale deliveries exceed 265 mgd, the SFPUC Retail customers would be required to pay an Environmental Surcharge for deliveries over 81 mgd (Total RWS deliveries in FY07/08 were 256.7 mgd).
f. Groundwater Supplies at Castlewood and In-City Irrigation.
g. WSIP Supply Sources (Recycled Water (4.0 mgd; Groundwater (2.0 mgd Existing and 2.0 from NWGWP, and WSIP Water Efficiency and Conservation (4.0 mgd).
h. Deficit occurs in year 2 and 3 of multiple dry year event, SFPUC implements its Drought Year Water Shortage Contingency Plans - RWSAP and WSAP would be required to balance supply and demand under this projected shortfall.

The deficit shown in 2010 is the result of the Phased WSIP, which restricts the SFPUC's allocation from the RWS supply to 81 mgd. Full development of the additional 10 mgd of new local supplies is projected to be available by 2015. However, current retail demand is much lower than the estimated 2010 demand in Table III.Q-3 (actual Fiscal Year 07/08 demand was 83.9 mgd).[1007] If retail demand exceeds the available RWS supply of 81 mgd between 2010 and 2015, and total RWS deliveries exceed 265 mgd between 2010 and 2015, the Water Supply Agreement allows the SFPUC to purchase additional water from the RWS for retail customers in the SFPUC service area by paying an environmental surcharge (total RWS deliveries in FY07/08 were 256.7 mgd, which is 8.3 mgd below the 165 mgd watershed delivery goal).[1008] After 2015, when the additional 10 mgd local supply is projected to be completed, the WSA shows no expected deficit in supply. The first phase of development of the Project is projected to be completed in 2019. It is expected, therefore, that the Project would not contribute to any deficiencies in supply experienced by the SFPUC between 2010 and 2015.

As shown in Table III.Q-3, after 2030, during the second and third year of a multiple dry-year period, the projected water supply would be slightly less than the estimated total retail demand, including demand associated with the Project. Thus, during multiple dry-year periods, the SFPUC would need to implement the provisions of the WSAP and RWSAP, which could include voluntary rationing or the curtailment of retail deliveries. With the implementation of the WSAP and RWSAP during multiple dry-year periods, existing and projected future water supplies would be sufficient to meet estimated future water demand.

III.Q.3 Regulatory Framework

Federal

Safe Drinking Water Act

The basic regulations governing the RWS are associated with the federal and California *Safe Drinking Water Act*s. The federal *Safe Drinking Water Act*, passed in 1974 and amended in 1986 and 1996, is the nation's primary law regulating drinking water quality and is implemented by the USEPA. The Act authorizes the USEPA to set national health-based standards for drinking water and requires many actions to protect drinking water and its sources, including rivers, lakes, reservoirs, springs, and groundwater wells. In addition to source water protection, the Act also provides for treatment, monitoring, sampling, analytical methods, reporting, and public information requirements. Implementation and enforcement of both the federal and California *Safe Drinking Water Act*s are under the jurisdiction of the California Department of Public Health (CDPH), Division of Drinking Water and Environmental Management. Drinking water regulations are set forth in the California Code of Regulations, Titles 17 and 22.

The amended federal S*afe Drinking Water Act* established phases of regulation and a number of regulatory deadlines to address drinking water requirements. This amended Act is implemented through subsidiary rules for regulation of specific contaminants or for monitoring or treatment requirements (USEPA 2007). The major USEPA drinking water regulations are listed below:

- Surface Water Treatment Rule
- Interim Enhanced Surface Water Treatment Rule

[1007] PBS&J, October 2009.
[1008] PBS&J, October 2009.

- Total Coliform Rule
- Stage 1 Disinfectants and Disinfection Byproducts Rule
- Stage 2 Disinfectants and Disinfection Byproducts Rule
- Long Term 1 Enhanced Surface Water Treatment Rule
- Long Term 2 Enhanced Surface Water Treatment Rule
- Variances and Exemptions Rule
- Lead and Copper Rule
- Radionuclides Rule
- Filter Backwash Recycling Rule
- Arsenic Rule
- Public Notification Rule

State

Water Conservation Projects Act

California's requirements for water conservation are codified in the *Water Conservation Projects Act of 1985* (Water Code Sections 11950–11954), as reflected below:

> Section 11952(a). It is the intent of the Legislature in enacting this chapter to encourage local agencies and private enterprise to implement potential water conservation and reclamation project.

Urban Water Management Planning Act

Section 10610.4 of the *California Urban Water Management Planning Act* specifies that "Urban Water Suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies." The SFPUC prepared and adopted the current Urban Water Management Plan in December 2005.

Water Code Sections 10910 et seq. (Senate Bill 610)

Effective January 1, 2002, the State of California, through Senate Bill 610 (SB 610), adopted a requirement that a city or county, and the associated public water system, prepare a Water Supply Assessment (WSA) for projects that meet certain criteria, including (1) a project creating the equivalent demand of 500 residential units, (2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space, and (3) a commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. The Project meets the criteria for requiring a WSA because it meets all of the criteria listed above.

In an effort to streamline the water supply planning process within San Francisco, the SFPUC adopted resolutions in 2002 and 2006 to allow for all development projects requiring a WSA under SB 610 (qualifying projects) to rely solely on the adopted UWMP without having to go through the process of preparing individual WSAs. Because the Planning Department and Agency are currently engaged in planning for various proposed land development projects that go beyond the future developments considered in the 2005 UWMP update, the SFPUC concluded that its 2005 UWMP no longer accounted for every qualifying project in San Francisco. Therefore, until the 2010 UWMP is prepared, any qualifying projects not accounted in the 2005

UWMP, including the Project, would require preparation of a WSA that considers the SFPUC's current and projected supplies when compared to projected demands associated with new growth not covered in the 2005 UWMP. The WSA prepared for the Project is included in Appendix Q1.

Water Code Section 73504(b)

Water Code Section 73504(b) requires the SFPUC to assign higher priority to delivery of water to the Bay Area than to the generation of electric power.

Local

San Francisco Green Building Ordinance

To minimize the use and waste of energy, water, and other resources in the construction and operation of buildings, to provide a healthy indoor environment, and to reduce greenhouse gas emissions, in 2008 the Board of Supervisors adopted the Green Building Ordinance, which applies to newly constructed residential and commercial buildings and renovations to existing buildings. The Ordinance specifically requires a minimum reduction of 20 percent in potable water use, rising to a minimum of 30 percent reduction in potable water use by 2011 for high-rise residential buildings, mid-size commercial buildings, and large commercial buildings (as defined in the Ordinance). In addition, the Ordinance also requires a minimum reduction of 50 percent in the use of potable water for landscaping for high-rise residential, mid-size commercial, and large commercial buildings.

III.Q.4 Impacts

Significance Criteria

The CCSF and Agency have not formally adopted significance standards for impacts related to water, but generally consider that implementation of the Project would have significant impacts on this resource if it were to:

Q.a Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

Q.b Require new or expanded water entitlements and resources, if there are not sufficient water supplies available to serve the project from existing entitlements and resources[1009]

Analytic Method

The analysis in this section focuses on the potential for a change in existing and projected water use as a result of Project implementation. The primary resources used for this analysis include the following technical documents: *Candlestick Point / Hunters Point Shipyard Phase II Water Demand Memorandum* (October 15, 2009) prepared by Arup; *Water Supply Assessment for the Proposed Candlestick Point—Hunters Point Shipyard Phase II Project* (October 2009), prepared by PBS&J; *Water Supply Availability Study of City and County of San Francisco* (October 2009) prepared by PBS&J; *SFPUC Urban Water Management Plan* (December 2005),

[1009] This standard has been slightly modified from the text found in CEQA Guidelines, Appendix G, for ease of comprehension.

prepared for the SFPUC; and the *Final Programmatic Environmental Impact Report for the Water System Improvement Program* (October 2008), prepared by the San Francisco Planning Department.

This section includes an evaluation of whether existing water treatment facilities have sufficient treatment capacity to serve the Project, and whether an adequate and reliable source of water would be available to serve the Project, both of which require an estimate of water demand that would result from Project implementation.

Estimates of water demand for the Project were developed for Lennar Urban by Arup[1010] and are summarized in Table III.Q-4 (Project Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance [mgd]). Water demand for the Project was derived from an estimate of a historical benchmark demand, adjusted to account for current California Building Codes and an additional adjustment to account for the requirements of the San Francisco Green Building Ordinance, including the installation of ultra-low flow fixtures, the use of high-efficiency building equipment, and efficient landscape irrigation techniques. An independent analysis performed as a part of the WSA, which analyzed similar land uses and assigned a demand factor for each use, concluded that the demand estimates provided by Arup are consistent with SFPUC demand factors.

Table III.Q-4 Project Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance (mgd)

Land Use	*Candlestick Point*	*Hunters Point Shipyard Phase II*	*Total*
Residential	0.61	0.22	0.83
Hotel	0.05	0.00	0.05
Office	0.04	0.02	0.06
R & D	0.00	0.36	0.36
Neighborhood Retail	0.02	0.02	0.04
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.02	0.02
Performance Venue	0.01	0.00	0.01
Subtotal	*0.82*	*0.65*	*1.47*[a]
Parks and Open Space	0.06	0.15	0.21
Total Demand	***0.88***	***0.70***[a]	***1.67***[a]

SOURCE: Arup, Candlestick Point–Hunters Point Shipyard Phase II Water Demand Memorandum, October 15, 2009.

a. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals used in this table. These entries are correct and consistent with Table 4-3 of the Water Supply Assessment.

Current land uses within the Project site include residential (Alice Griffith Public Housing) and recreational (including the Candlestick Point State Recreation Area [CPSRA] and Candlestick Park stadium), and a mostly vacant former shipyard. According to water meter readings from the Project site, current water use is approximately 0.3 mgd.[1011] Thus, based on a total estimated Project-related demand of 1.67 mgd (per

[1010] Arup, Candlestick Point/Hunters Point Shipyard Phase II Water Demand Memorandum, October 15, 2009.
[1011] PBS&J, October 2009.

Table III.Q-4) and current water use of 0.3 mgd from existing land uses, the net impact of the Project on water demand would be an increase of approximately 1.37 mgd.

Existing and projected future water supplies for SFPUC retail customers were compared with estimated future demand to determine whether water supplies would be sufficient to meet Project-related demands. The current status of ongoing water supply improvements was also assessed, to determine whether the anticipated future water sources would be available.

The current and planned treatment capacity of existing water treatment facilities was also reviewed to determine whether sufficient capacity exists to provide water treatment service to the Project.

Construction Impacts

Significance Criterion Q.a, above, indicates that the Project would have a significant adverse effect if it would require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. The Infrastructure Plan for the Project would include a low-pressure water system, a reclaimed water system, an AWSS, and separate sanitary sewer and storm drainage facilities. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D (Transportation and Circulation), Section III.H (Air Quality), Section III.I (Noise), Section III.J (Cultural Resources and Paleontological Resources), Section III.K (Hazards and Hazardous Materials), Section III.L (Geology and Soils), Section III.M (Hydrology and Water Quality), Section III.O (Public Services), and Section III.S (Greenhouse Gas Emissions) of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of water conveyance or treatment infrastructure associated with the Project.

The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with the Project.

Operational Impacts

Although other sections of this EIR provide separate impact assessments for development at Candlestick Point and HPS Phase II, segregating the discussion of impacts on water treatment facilities and water supplies would not provide any additional meaningful information. Thus, for the purposes of clarity, this section only provides an assessment of Project impacts, which includes both components of the Project.

Impact UT-1: New or Expanded Water Entitlements and Resources

Impact UT-1 **Implementation of the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements. (Less than Significant)** ***[Criterion Q.b]***

Implementation of the Project would generate a total demand of approximately 1.67 mgd (per Table III.Q-4). This demand is based on an estimate of a historical benchmark demand, adjusted to account for current California Building Codes and the requirements of the San Francisco Green Building Ordinance, which would require the installation of ultra-low flow fixtures, use of high-efficiency building equipment, efficient landscape irrigation techniques, and provision of water-efficient plant materials. As

current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Project on water demand would be an increase of approximately 1.37 mgd.

The Phased WSIP allocates 81 mgd from the RWS to retail customers. An additional 3.5 mgd of groundwater is provided from local groundwater basins. An additional 10 mgd would be provided from additional groundwater and recycled water projects, and from conservation measures that reduce demand (which the SFPUC identifies as a conservation supply). Total SFPUC retail water supply is estimated to vary between 93 and 94.5 mgd, depending on hydrologic conditions (per Table III.Q-1). Total future retail demand, including Project-related demand, is projected to increase from 91.81 mgd in 2010 to 93.42 mgd in 2030 (per Table III.Q-2). At the time of the first phase of Project implementation, sometime after 2015, SFPUC projects that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions.

A comparison of total retail water supply to estimated water demand (per Table III.Q-3) shows that after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with the Project. With the implementation of the WSAP and RWSAP during multiple dry-year periods, which could include voluntary rationing or other water conservation strategies, existing and projected future water supplies could accommodate estimated future water demand, including the Project-related demand of approximately 1.37 mgd. As discussed in the WSA, the SFPUC has approved and has made substantial progress towards the implementation of the water facility improvement projects identified in the WSIP. The SFPUC has received voter approval to fund the Phased WSIP program and has initiated bond sales to fund implementation of individual projects, which are in various stages of implementation, including subsequent environmental review, design, or construction.[1012] Thus, there is substantial evidence that the SFPUC would implement the Phased WSIP facility projects described above, including the local water supply projects.

The local water supply projects, described in the setting, include: the San Francisco Groundwater Supply Project; the Westside Recycled Water Project; the Eastside Recycled Water Project, the Harding Park Recycled Water Project, and various conservation efforts. Collectively, these projects are estimated to provide approximately 10 mgd.[1013,1014] Of these projects, environmental review has been completed for the Harding Park Projects, and will soon be initiated for the other projects. The local water supply improvement projects were approved as part of the Phased WSIP and are included in the WSIP funding program. The SFPUC has initiated planning, environmental review, and design of several recycled water and groundwater projects and conservation programs are in place. Thus, there is substantial evidence that the additional water provided by those projects would be available to supplement retail water supplies.

[1012] Per the *Water System Improvement Program Quarterly Report, Q4, FY 2008/2009* (dated August 20, 2009), (prepared by the SFPUC), as of July 1, 2009, two (2) projects are in the Planning Phase, eleven (11) projects are in the Design Phase, six (6) projects are in the Bid and Award Phase, five (5) projects are in the Construction Phase, two (2) projects in the Close-Out Phase, eight (8) projects are completed, one (1) project has not been initiated, and eleven (11) projects have multiple active phases. Available at: http://sfwater.org/Files/Reports/01_RW_Program_Summary.pdf Accessed September 28, 2009.

[1013] San Francisco Planning Department, Final Program Environmental Impact Report, Water Supply Improvement Program, October, 2008.

[1014] SFPUC, Urban Water Management Plan, 2005.

As noted above, the SFPUC adopted the Phased WSIP, which phased implementation of the water supply program to provide an additional 20 mgd of supply to meet projected demand through 2018 and requires the SFPUC to re-evaluate water demands and water supply options by December 31, 2018 through 2030 to meet projected demand. The Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, and this impact is less than significant. No mitigation is required.

Impact UT-2: Construction of New or Expansion of Existing Water Treatment or Conveyance Facilities

Impact UT-2 **Implementation of the Project would not require or result in the construction of new or expanded water treatment facilities. The Project would require the expansion of an auxiliary water conveyance system to provide adequate water supply for firefighting to the Project site. (Less than Significant with Mitigation)** ***[Criterion Q.a]***

SFPUC determined in developing the WSIP that while it was meeting its core mission to serve San Francisco and its Bay Area customers with reliable, high-quality and affordable water, a long-term program was needed to reliably meet its mission in the future. The WSIP identified facility projects that would allow it to meet water supply, delivery reliability, seismic safety and water quality goals. In adopting the Phased WSIP, the SFPUC committed to implementing all of the identified facility projects, all of which underwent programmatic environmental review in the WSIP PEIR. As explained earlier, two of those projects would assist the SFPUC in meeting delivery reliability goals established for its two treatment plants. These projects are now undergoing project-level environmental review. It also identified a facility to provide for advanced disinfection of water from the Hetch Hetchy system, a project now under construction.

In addition, per SFPUC approval of the Phased WSIP, the SFPUC is proceeding to develop an additional 10 mgd of local supply from local recycled water and groundwater projects and additional conservation measures. The SFPUC is now in the planning and project-level review stage of these facility projects. Treatment requirements for these sources of water are included in the scope of those facility projects.

All of the projects identified above are planned for implementation irrespective of whether the Project is approved. As indicated in Table III.Q-3, water supply with the projects planned under the Phased WSIP would be sufficient in future years to meet normal demand, which includes Project demand. Implementation of the Project would not affect the treatment requirements of either of those sources of water. The groundwater and recycled water projects are in the planning and project-level environmental review phase now and are expected to be implemented before the first phase of the Project is expected to be completed. Implementation of water conservation measures, including those provided as part of the Project would reduce demand for water and would, therefore, not affect the treatment capacity of existing or proposed water treatment facilities.

As the current and planned facility projects under the Phased WSIP would provide for sufficient treatment capacity for the water to be supplied under the Phased WSIP and the Phased WSIP supply is sufficient to serve the Project, implementation of the Project would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant. No mitigation is required.

The Hunters Point Shipyard Reuse Environmental Impact Report (SCH #95072085, certified February 8, 2000) determined that the existing water system has insufficient pressure for adequate fire protection in certain portions of the Project site. The Project would expand the existing off-site AWSS by providing an AWSS loop at Candlestick Point that would connect to the planned extension of the existing off-site AWSS on Gilman Street from Ingalls Street to Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road.

The following mitigation measure shall be implemented:

MM UT-2 *Auxiliary Water Supply System. Prior to issuance of occupancy permits, as part of the Infrastructure Plan to be approved, the Project Applicant shall construct an Auxiliary Water Supply System (AWSS) loop within Candlestick Point to connect to the City's planned extension of the off-site system on Gilman Street from Ingalls Street to Candlestick Point. The Project Applicant shall construct an additional AWSS loop on HPS Phase II to connect to the existing system at Earl Street and Innes Avenue and at Palou and Griffith Avenues, with looped service along Spear Avenue/Crisp Road.*

This AWSS would ensure the provision of adequate water for on-site fire-fighting purposes, and the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact is less than significant with implementation of this mitigation measure.

Cumulative Impacts

The geographic context for an analysis of cumulative impacts to water resources is the service area of the Regional Water System (RWS) operated by the SFPUC. The past and present water supply and water treatment capacity in the RWS service area is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable development includes future growth incorporated into the 2005 Urban Water Management Plan, and the updated demand projections included in the WSA (dated October, 2009) which included updated projections for San Francisco developed by San Francisco Planning Department (*Projections of Growth by 2030*, dated July 9, 2009).

Water in the Project area is provided by the SFPUC, which manages the RWS and provides wholesale water service to 27 Bay Area water agencies located in Alameda, San Mateo and Santa Clara Counties (wholesale customers), and retail water for the residents, businesses, and industries within the municipal boundaries of the City and County of San Francisco (and various other customers in San Mateo, Alameda, and Tuolumne Counties).

To enhance the reliability of the RWS, improve dry-year supplies, diversify the water supply portfolio, and meet projected wholesale and retail demand through 2030, the SFPUC developed the WSIP, which proposed a program of facility improvement and water supply improvement projects to accommodate a projected increased in annual average demand from 265 mgd to 300 mgd. The SFPUC subsequently adopted the Phased WSIP to implement the facility improvement projects that would meet public health, seismic safety, and delivery reliability goals, but with phased implementation of the water supply program, with an additional supply of 20 mgd from recycled water, groundwater and conservation projects proposed

to meet projected demand through 2018. By December 31, 2018, the SFPUC must re-evaluate water demands and water supply options and allocate available water supplies to meet the demand through 2030.

Per the Phased WSIP, retail water supplies to San Francisco, including the Project area, are comprised of deliveries from the RWS, groundwater, and the identified local water supply improvement projects. With these sources, retail water supplies are estimated to vary between 93 and 94.5 mgd (as shown in Table III.Q-1), depending on hydrologic conditions. Total retail water demand, including demand from the Project, several major development proposals (as discussed in the WSA), and background growth from ABAG projections and the 2005 UWMP is estimated to increase from 91.81 mgd in 2010 to approximately 93.42 mgd by 2030 (per Table III.Q-2).

When average annual retail water supply and demand are compared (in Table III.Q-3), after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including the cumulative demand associated with the Project, major development proposals, and background growth. During multiple dry-year periods, the SFPUC would need to implement the provisions of the WSAP and RWSAP, which could include voluntary rationing or the curtailment of retail deliveries. With the implementation of the WSAP and RWSAP during multiple dry-year periods, existing and projected future water supplies could accommodate cumulative future retail water demand.

Implementation of the Phased WSIP would ensure sufficient water supply and water treatment capacity for the Project and estimated current and future retail demand. Provision of an AWSS on site and connection to the existing off-site AWSS by implementation of mitigation measure MM UT-2 would ensure adequate water for firefighting purposes. As no additional water supply or water treatment capacity is needed to serve the Project and projected future development beyond the supply identified under the Phased WSIP, the Project would not make a considerable contribution to a cumulative impact on water supply. The Project's cumulative impact on water supply is less than significant.

Wastewater

III.Q.5 Setting

San Francisco Combined Sewer System

Project Site

At Candlestick Point, the Candlestick Park stadium and Alice Griffith public housing site contribute to the Combined Sewer System, while the Candlestick Point State Recreation Area (CPSRA) and portions of the stadium parking lots have separate storm sewer systems. Stormwater at HPS Phase II does not flow to the City's Combined Sewer System, but is discharged to the Bay via separate stormwater system outfalls and overland flows.

Overview

Most stormwater runoff in the City is collected via a Combined Sewer System, managed by the SFPUC. This system combines stormwater runoff and wastewater flows in the same network of pipes (Combined Sewer System), conveying flows to facilities where they are treated prior to discharge to the Lower Bay or

Pacific Ocean through outfall structures along the shoreline. Discharges into the combined sewer are regulated under two individual National Pollutant Discharge Elimination System (NPDES) permits (waste discharge requirements [WDRs]) issued by the RWQCB as discussed in the Regulatory Framework. The City is divided into two major drainage areas: Oceanside and Bayside. The Project site is in the Bayside Drainage Area. This area is further divided into subbasins: North Shore, Channel, Islais Creek, Yosemite, and Sunnydale, all of which flow to the Southeast Water Pollution Control Plant (SWPCP). The North Point Wet Weather Treatment Facility (NPWWTF), located on Bay Street, operates only during wet-weather conditions to treat combined storm flows. Figure III.M-1 (Combined and Separate Storm Sewer System and Receiving Water Bodies) in Section III.M depicts the wastewater infrastructure that serves the City and the Project site, including an illustration of the areas that are currently served by the combined sewer and stormwater system and areas that are served by a separate sewer and stormwater system.

The capacity of the system, along with treatment and pumping capacities, is based on design criteria imposed by the RWQCB in the City's NPDES permits that were calculated for the purpose of protecting beneficial uses and achieving compliance with water quality standards, based on 70 years of annual rainfall data. The design criteria required construction of control facilities designed to store and treat enough wastewater to limit wet-weather discharges to an annual long-term average of 10, 8, 4, or 1, depending on the location of the discharge. In the Project vicinity, the wet-weather facilities have been designed and constructed to achieve a long-term annual average of 1 discharge to ensure that most wastewater receives secondary treatment (removal of settleable materials and partial removal of dissolved materials).

Dry Weather

During dry weather, wastewater and any dry-weather runoff (e.g., irrigation runoff, discharge from underground springs, or pipe leaks) from the eastern portion of the City are conveyed to the SWPCP, at Phelps Street between Jerrold and Evans Avenues, just northwest of the Project site (refer to Figure III.M-2 [Major Water Quality Features]). The SWPCP treats approximately 67 million gallons per day (mgd) during dry weather (approximately 80 percent of the City's total wastewater flow)[1015] to a secondary treatment standard, with a total capacity to treat 150 mgd. Secondary treatment uses pure oxygen to encourage growth of microorganisms that consume organic material and improve the purity of the wastewater. Wastewater is then put into a second round of settling tanks where the microorganisms are separated from the purified water. Effluent is disinfected and dechlorinated before discharge. Treated wastewater is then discharged through the Southeast Plant deep water outfall at Pier 80 or through the Quint Street outfall to the Islais Creek Channel.

The Combined Sewer System also includes the Bayside Wet Weather Facilities (BWWF), which consist of interconnected large underground rectangular tanks and tunnels with a series of baffles and weirs that are designed to remove settleable solids and floatables. During dry weather, the BWWFs transport combined stormwater and wastewater to the SWPCP.

[1015] San Francisco Public Utilities Commission, website: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/117/MTO_ID/225, accessed July 22, 2009.

Wet Weather

At full wet-weather capacity, discharge at the Pier 80 outfall is maximized to 110 mgd; a blend of 100 mgd primary treatment and 10 mgd secondary treatment. The remaining 140 mgd receiving secondary treatment is discharged via the Quint Street shallow water outfall into Islais Creek Channel, which occurs an average of 600 hours per year.

The NPWWF is operated on a seasonal, as-needed basis to supplement the treatment capacity of the SWPCP. During larger storm events, excess flows that cannot be treated at the SWPCP are treated at the NPWWF, at 111 Bay Street, about 3.5 miles north of the Project site, which provides primary treatment and disinfection capacity for an additional 150 mgd of wet-weather flows. The treatment process at the NPWWF consists of primary sedimentation, clarification, floatables removal, disinfection, and dechlorination operations. It treats only wet-weather flow that consists of domestic and industrial wastewater mixed with stormwater runoff to a maximum capacity of 150 mgd. Treated flows from this facility are discharged through four deep-water outfalls, approximately 800 feet from the Bay shoreline and 18 feet below mean low water. Two of the deep-water outfalls terminate at the end of Pier 33, and two terminate at the end of Pier 35 on the northeastern Bay.

If the combined wet-weather flows exceed 150 mgd, the NPWWF can also treat an additional 100 mgd to a primary treatment standard (removal of settleable materials) plus subsequent disinfection and dechlorination.[1016] Wet weather flows that are treated to the primary standard (plus disinfection) are only discharged from the Southeast Pollution Control Outfall (Pier 80 outfall). San Francisco operates the only municipal wastewater facilities in California where, on an annual basis, approximately two-thirds of the stormwater runoff receives secondary treatment.

The Bayside Wet Weather Facilities, during wet-weather conditions, provide storage and treatment that is equivalent to wet weather primary treatment. During wet weather, the underground transport tunnels provide a total storage capacity of approximately 193 million gallons, while pumps continue to transfer combined wastewater and stormwater to the SWPCP. When the combined capacity of the SWPCP and the NPWWF is exceeded, the wet weather facilities retain storm flows for later treatment. The tanks allow floatable and settleable solid materials to be removed, similar to primary treatment processes. The materials retained in the storage and transport boxes are flushed to the treatment plants after storms.

This level of treatment meets the minimum treatment specified by the USEPA Combined Sewer Overflow Control Policy (CSO Policy) I50 FR 18688; April 11, 1994. In the event that the capacities of the SWPCP, the NPWWF, and wet weather facilities and storage structures are exceeded, the combined stormwater and sewage, after receiving the equivalent of wet weather primary treatment in the transport structures/boxes, is discharged into San Francisco Bay through any one of the 29 shoreline combined sewer overflow (CSO) structures. The outfalls associated with these CSO structures are very wide diameter pipes or box culverts. All solids that settle out in the storage/transport structures are flushed to the SWPCP after the rainstorm subsides.

During large storm events that cause the flow in the SWPCP to exceed 110 mgd, the complete filling of the treatment and storage capacities of the combined system cause excess flows to receive "flow-through

[1016] San Francisco Public Utilities Commission, 2008. *System Overview: Wastewater System Map.* Accessed online November 6, 2008 at: http://sfwater.org.

treatment," similar to primary treatment, to remove settleable solids and floatable materials. Flows are then discharged into the Bay, through any one of 29 CSO structures located along the City's Bayside waterfront from Fisherman's Wharf to Candlestick Point. The volume of a CSO discharge is a function of the storm intensity, storm duration, treatment rate, and available storage. CSO discharges typically consist of about six percent sewage and 94 percent stormwater.[1017] All solids that settle out in the storage/transport structures are flushed to the SWPCP after the rainstorm. There are six CSO structures in the vicinity of the Project site, in Yosemite Slough (South Basin) and Candlestick Cove. Figure III.M-2 in Section III.M shows the location of the CSO structures relative to the Project site.

Table III.M-1 shows a summary of CSO events that occurred in 2006 by discharges from the SWPCP, NPWWP, and BWWF. CSOs 040 through 043, which are adjacent to the Project site at Yosemite Slough and South Basin, had two CSO events per outfall. Treatment plant and CSO discharge points are shown on Figure III.M-2.

SFPUC Five-Year Wastewater Capital Improvement Program

The SFPUC launched the Wastewater Enterprise Interim Capital Improvement Program (Interim CIP) to address the immediate needs of San Francisco's wastewater system. These special projects are aimed at reducing flood risk, reducing wastewater odors, and improving treatment facilities. The Interim CIP addresses immediate critical needs while a long-term comprehensive capital plan is developed through the SFPUC's strategy review. Several Interim CIP projects are currently under construction, including the Channel Pump Station Improvements Project, Southeast Wastewater Treatment Plant Gas Handling Improvements - Phase 2, Oceanside Wastewater Treatment Plant Aging Infrastructure Project (Ventilation Improvements), and the Southeast Wastewater Treatment Plant Digester Odor Improvement - Phase 1.

Biosolids Environmental Management System

Biosolids are nutrient-rich organic materials resulting from the biological and physical treatment of wastewater in a treatment facility. San Francisco produces over 80,000 tons of biosolids a year that are transported to landfills in Alameda, Contra Costa, and Solano counties and two land application sites in Solano and Sonoma counties. To ensure environmentally sound disposal of biosolids, San Francisco has committed to prepare and implement an Environmental Management System (EMS), a voluntary program that would implement best management practices developed by the National Biosolids Partnership for odor, traffic, noise, and dust control, as well as the management of nutrients.

Bayside Systems and Facilities Operations Plan (2002)

The Master Plan for wastewater management completed in 1971 and modified in 1982 included the Bayside Transport/Storage System (Bayside System), consisting of expansion of the SWPCP, completion of the Bayside Core System (Griffith Pump Station and Yosemite Facilities), and construction of the Sunnydale Facilities, Mariposa Facilities, and Islais Creek Facilities, each of which was completed at various times but all by 1997. The City's NPDES permit (see Regulatory Framework, below) requires the City to prepare a systems and facilities Operations Plan that will:

[1017] City and County of San Francisco, Public Utilities Commission, and Port of San Francisco, 2009, op. cit.

- Maximize the volume of wastewater treated at either the Southwest treatment plant or the North Point Wet Weather Facility and discharged via deep water outfalls, consistent with the hydraulic and treatment capacities of the Discharger's storage, transport, and treatment facilities
- Ensure that all discharges from the diversion structures are first baffled to reduce floatables volumes

The Bayside Systems and Facilities Operations Plan describes the operations strategy that will be implemented to meet these objectives.

Project Site Wastewater System

Within Candlestick Point, the CPSRA and portions of the paved areas around the Candlestick Park stadium are served by separate wastewater and stormwater systems that drain to the Bay. Other portions of Candlestick Point, including the Alice Griffith Public Housing site and Candlestick Park stadium itself, currently contribute both wastewater and stormwater to the Combined Sewer System. The Project site is served by the Bayside Transport/Storage System in the southeast drainage area, which consists of the Hunters Point and Yosemite Transport Systems, Griffith Pump Station, and Sunnydale Transport and Pump Station Facilities.[1018] The storage/transport system holds the combined sewage and stormwater for later treatment at the wastewater treatment plant and is sized to accommodate both dry- and wet-weather flows. The storage/transport system provides some treatment by settling out solids and skimming of floatables. It is primarily used for storage during and after storms, but also provides storage in the event of a power failure. Catch basins collect stormwater runoff from City streets and discharge runoff into the Combined Sewer System. If the capacity of sewer pipes is exceeded during storms, excess flow is directed to the storage/transport boxes. Approximately one to ten times per year, a storm exceeds the capacity of the storage/transport box, and a discharge (CSO) occurs (refer to Section III.Q.5 [Setting]).

Sunnydale transport/storage box and pump station facilities are used only for wet weather. During wet weather, combined sewage is diverted from the gravity system to the transport system, with a storage volume of 5.7 million gallons, and then flows to the Sunnydale Pump Station, which has a capacity of 50 mgd.

Wastewater from Candlestick Point combines with flows from the Sunnydale Facilities in the Candlestick tunnel sewer prior to entering the Yosemite Transport System, then flowing to the Griffith Pump Station. The present average dry-weather flow through the Candlestick tunnel sewer entering the Yosemite Transport System is 6 mgd, including that from the Sunnydale watershed. The Yosemite Transport System and existing sewers have a storage volume of 11.5 million gallons and convey dry- and wet-weather flows from the Yosemite/Fitch area and Sunnydale area to the Griffith Pump station. The Griffith Pump Station receives all Sunnydale and Yosemite/Fitch discharges via gravity flow, which is then pumped to the Hunters Point tunnel sewer. Pumping capacities for the Griffith Pump Station are 10 mgd in dry weather and 120 mgd in wet weather. Dry-weather flows from the Griffith Pump Stations are relatively small.[1019] The South Basin and Hunters Point flows enter the SWPCP at Rankin Street.

[1018] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.
[1019] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.

Existing residential uses in Candlestick Point generate approximately 76,800 gpd[1020] of wastewater to the Combined Sewer System, while football games and other events at the Candlestick Park stadium generate up to 280,000 gpd[1021] of wastewater on event days (assuming a sold-out event). The volume of flows from the Alice Griffith Public Housing site and portions of the parking lots surrounding Candlestick Park stadium is unknown, as the SFPUC does not monitor volumes from individual land uses or areas. However, this flow would be included in the existing baseline flows routed to the SWPCP. Wastewater flows from the HPS Phase II site are minimal, as sewage lines are no longer in use in this area, with the exception of waste from the artists' studios. Based on meter data from January 2000 to August 2002, the HPS Phase II site generated an average of 0.154 mgd of wastewater flow. Thus, the majority of the HPS Phase II does not currently contribute notable wastewater to the Combined Sewer System. The Navy is removing the entire wastewater system at Hunters Point Shipyard as part of its environmental remediation program.

The Candlestick tunnel sewer has an average daily dry-weather flow of 2.5 mgd (1,736 gpm) and a design capacity of 50 mgd (34,722 gpm).[1022] The Hunters Point tunnel sewer has an average dry-weather flow of 6 mgd (including the 2.5 mgd from the Candlestick tunnel sewer) (4,167 gpm) and a design capacity of 120 mgd (83,333 gpm).[1023]

III.Q.6 Regulatory Framework

In the Project site, water resources policies are administered by several agencies, including the RWQCB; the State Water Resources Control Board (SWRCB), and the USEPA. Development of the Project is subject to the federal *Clean Water Act*, the California *Porter-Cologne Water Quality Control Act* (Porter-Cologne Act), applicable *Water Code* sections (plans and policies adopted by the SWRCB and RWQCB); and permitting and licensing requirements that occur during development review by the City and County of San Francisco.

Federal

Clean Water Act

The 1972 amendments to the federal *Clean Water Act* (CWA) prohibit the discharge of pollutants to navigable waters from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. The RWQCB issue NPDES permits for stormwater and wastewater outfalls (point sources). Issued by the RWQCB in five-year terms, an NPDES permit contains discharge prohibitions, effluent limitations, and necessary specifications and provisions that ensure proper treatment, storage, and disposal of the waste. The permit often contains a monitoring program that establishes monitoring stations

[1020] Calculated as 256 units and 300 gallons per day, using the residential wastewater generation factor from the *Candlestick Point/ Hunters Point Shipyard Infrastructure Concept Report* (2007) prepared by Winzler & Kelly Consulting Engineers.
[1021] Calculated as 70,000 seats (in football configuration) and 4 gallons per seat day per day, per the wastewater generation rate for stadium uses in the Final Environmental Impact Report for the Los Angeles Coliseum Renovation Project, November 21, 2003 (SCH# 1990011065).
[1022] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.
[1023] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.

at effluent outfalls and receiving waters. NPDES permits are individually issued for point-source discharges, which usually refer to waste emanating from a single, identifiable location; a non-point source usually refers to waste emanating from diffuse locations. Stormwater is considered to be a non-point source if stormwater is discharged as overland flow, not from an identifiable location such as a pipe.

Discharges from the SWPCP, NPWWF, and BWWF, including CSOs, are regulated under the individual waste discharge requirements (NPDES Permit set forth in Order No. R2-2008-0007 and NPDES No. CA0037664). Stormwater discharges regulated under the NPDES program are discussed in Section III.M. Sheet/overland flow is a non-point source not regulated under the NPDES program.

State

Operation of the SWPCP is subject to regulations set forth by the SWRCB and California Water Code.

Local

San Francisco General Plan

The Environmental Protection chapter and the Community Facilities chapter of the *San Francisco General Plan* contain the following policies relating to wastewater:

Environmental Protection

Objective 3 Maintain and improve the quality of the Bay, ocean and shoreline areas.

Policy 3.3 Implement plans to improve sewage treatment and halt pollution of the Bay and ocean.

Community Facilities

Objective 10 Locate wastewater facilities in a manner that will enhance the effective and efficient treatment of storm and wastewater.

Policy 10.1 Provide facilities for treatment of storm and wastewater prior to discharge into the Bay or ocean. Locate such facilities according to the Wastewater and Solid Waste Facilities Plan.

III.Q.7 Impacts

Significance Criteria

The CCSF and Agency have not formally adopted significance standards for impacts related to wastewater, but generally consider that implementation of the Project would have significant impacts on these resources if it were to:

Q.c Require or result in the construction of new wastewater treatment or collection facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

Q.d Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments

Q.e Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board[1024]

Analytic Method

Water use and wastewater flows are related. In general, wastewater is generated from indoor water uses, such as flushing the toilet, bathing, or cooking uses. Historical benchmark water demand by land use and end use were calculated for the Project and are described in Table 6 of the Water Demand Memorandum prepared by Arup on October 15, 2009 (refer to Appendix Q2). Sanitary sewer flows were determined utilizing wastewater generation percentages based on land use and end use water demand (refer to Table 7 of Appendix Q2). These factors were then adjusted to account for conformance with Green Building Ordinance requirements. Project wastewater estimates, shown in Table III.Q-5 [Project Wastewater Generation], were made based on estimated water demand in Table 7 of Appendix Q2 and consistent with PUC-recommended methodology. Parks and open space wastewater generation (runoff) is not included in this table, as it would not be conveyed off site to the sewer system.

Table III.Q-5 Project Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as % of Water Demand (or as otherwise specified)*	*Candlestick Point (mgd)*	*Hunters Point (mgd)*	*Total Project (mgd)*
Residential	95%	0.58	0.21	0.79
Regional Retail	57%	0.05	0	0.05
Neighborhood Retail	57%	0.01	0.01	0.02
Office	57%	0.02	0.01	0.03
Community Uses	57%	0.01	0.01	0.02
Research and Development	57%	0	0.21	0.21
Hotel	57%	0.03	0	0.03
Football Stadium	95%	0	0.02	0.02
Performance Venue	95%	0.01	0	0.01
Total		***0.71***	***0.47***	***1.18***

SOURCE: Arup, October 15, 2009.

Wastewater impacts were determined by comparing the estimated future wastewater flows to the capacity of off-site conveyance lines and the wastewater treatment plants to determine whether sufficient capacity exists or whether there is the need for additional wastewater conveyance or treatment systems. As discussed in Section III.M, stormwater from Alice Griffith Public Housing site, Candlestick Park stadium, and portions of parking lots surrounding Candlestick Park stadium would no longer contribute stormwater flows to the Combined Sewer System, which would increase the available capacity in the Candlestick tunnel sewer and Hunters Point tunnel sewers.

[1024] This standard has been slightly modified from the text found in CEQA Guidelines, Appendix G, for ease of comprehension.

As noted, above, the Yosemite transport system and existing sewers have a storage volume of 11.5 million gallons. Although the current volume of stormwater flows from the Project site is not known, the increase in wastewater flows associated with development at Candlestick Point would likely be offset by the reductions in stormwater flows that would result from the installation of a separate stormwater collection and treatment system at Candlestick Point. However, for the purposes of this analysis, no credit is taken for the eliminated stormwater flows from the Candlestick Point site.

The Project would construct separate stormwater and wastewater systems. Thus, during wet weather, stormwater from the Project site would not enter the Combined Sewer System; the only Project flows that would enter the Combined Sewer System, during both dry and wet weather, would be wastewater. For the purposes of this analysis, dry-weather peak flows from the Project would be the same as wet-weather peak flows and there is no need to analyze stormwater flow volumes from the Project relative to conveyance capacity in this section (refer to Section III.M), for a full analysis of stormwater conveyance and treatment). Therefore, Project dry-weather peak flows are assumed to be the same as wet-weather flows.

Peak dry-weather flow capacities can be calculated by multiplying the average gallons-per-minute flow by a peaking factor. For purposes of this analysis, a conservative peaking factor of 3.0 was used, which yields a maximum flow capacity of 5,208 gpm for the Candlestick tunnel sewer and 12,501 gpm for the Hunters Point tunnel sewer. The capacity of conveyance systems is analyzed by comparing maximum peak flows to the design capacity of the trunk line, expressed in gallons per minute (gpm). Wastewater treatment capacity is analyzed by comparing the daily treatment capacity of the plant, expressed in million gallons per day (mgd), with the existing conditions plus Project wastewater generation. Table III.Q-6 (Sewer Trunk Capacity and Project Maximum Peak Flows) illustrates the design capacity of the two sewer trunk lines serving the Project site, the existing average flow, the calculated existing maximum peak flow, the Project's contribution to the off-site conveyance infrastructure, and the remaining capacity (with the Project) of each of the two trunk lines. The Candlestick tunnel sewer flows into the Hunters Point tunnel sewer, and the data below reflect those combined flow volumes. However, because only conveyance capacity in the Candlestick tunnel sewer would require analysis, those data are also provided. Candlestick Point development discharges to the Candlestick and Hunters Point tunnel sewer, while discharges from the HPS Phase II site flow into the Hunters Point tunnel sewer only.

Several planning studies, referenced in the introduction to this section, were prepared to identify the wastewater demand of the Project and the associated conveyance infrastructure necessary for the Project. This analysis relies on those estimates. As wastewater generation is a function of potable water demand, the baseline year for purposes of the wastewater analysis is 2009 to coincide with the date of the WSA that has been prepared for the Project.

Appendix Q1 describes two different methods to calculate wastewater generation: (1) percentage of water demand, and (2) by end use (e.g., toilets, laundry, process water, etc.). Utilizing the first method of calculating wastewater flows, the Project would generate a total of 1.18 mgd of wastewater; utilizing the second method, the Project would generate approximately 0.98 mgd. These calculations both assume full compliance with the Green Building Ordinance. The impact analysis that follows uses the more conservative estimate of 1.18 mgd of wastewater generated by the Project.

Table III.Q-6 Sewer Trunk Capacity and Project Maximum Peak Flows

Sewer Trunk	*Design Capacity (gpm)*	*Existing Average Dry-Weather Flow[a] (gpm)*	*Existing Maximum Peak Dry-Weather Flow[b] (gpm)*	*Project Contribution—Maximum Peak Dry-Weather Flow[c] (gpm)*	*Remaining Peak Flow Capacity (gpm) With Project*
Candlestick tunnel sewer	34,722	1,736	5,208	1,479	28,035[e]
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	979	69,853[f]

SOURCE: Bayside Systems and Facilities Operations Plan, 2002.

a. Calculated as existing average dry-weather flow in mgd/24 hours/60 minutes x 1,000,000.
b. Calculated as existing average flow in gpm x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in mgd/24 hours/60 minutes X 1,000,000 X peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses at Candlestick Point (including Alice Griffith Public Housing, the RV park, and the stadium) that would be demolished on site and that currently contribute to the Candlestick tunnel sewer. Therefore, the actual remaining peak flow capacity of the Candlestick tunnel sewer with the Project would be somewhat greater than 28,035 gpm.
f. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses on the HPS Phase II site that would be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with the Project would be somewhat greater than 69,853 gpm.

As required by the Green Building Ordinance, high-rise and large buildings would be required to reduce water use by 30 percent in the year 2011 from a benchmark level adjusted for code. This requirement would result in a corresponding decrease in wastewater generation. Methods to achieve this standard could include, but are not limited to, low-flow plumbing fixtures, waterless urinals, and dual-flush toilets. Additional requirements for high-rise residential and large commercial buildings include water-efficient landscaping to reduce potable water use by 50 percent. Wastewater volume estimates take these Green Building Ordinance requirements into account. Peak dry-weather flow was calculated by multiplying the average gallons-per-minute flow by a peaking factor. For purposes of this analysis, a conservative peaking factor of 3.0 was used.

Construction Impacts

Significance Criterion Q.c, above, indicates that the Project would have a significant adverse effect if it would require or result in the construction of new wastewater treatment or collection facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of wastewater conveyance or treatment infrastructure associated with the Project.

Operational Impacts

Impact UT-3: Wastewater Conveyance and Treatment

The following discussion is organized to first address the adequacy of the wastewater conveyance system for Candlestick Point and HPS Phase II separately, followed by a discussion of the adequacy of the wastewater conveyance system and treatment facilities for the Project.

Wastewater Conveyance

Impact of Candlestick Point

Impact UT-3a **Implementation of the Project at Candlestick Point would not require expansion of existing off-site wastewater conveyance facilities. (Less than Significant with Mitigation)** ***[Criterion Q.d]***

Dry-Weather Conditions

Wastewater flows from the Candlestick Point site enter the Candlestick tunnel sewer, combining with flows from the Sunnydale Transport System, and enter the Yosemite Transport Facilities. The flows proceed through the Griffith Pump Station and then through the Hunters Point sewer tunnel, eventually combining with flows from the Islais Creek Transport System and entering the SWPCP. As indicated by Table III.Q-6, the Candlestick tunnel sewer has an average dry-weather flow of 2.5 mgd (1,736 gpm) and a design capacity of 50 mgd (34,722 gpm). The existing maximum dry-weather peak flow from the Candlestick Point site into the Candlestick tunnel sewer is 5,208 gpm (existing average daily flow times peaking factor). Projected maximum peak flows from the Candlestick Point portion of the Project, based on a peaking factor of 3.0, would be approximately 1,479 gpm, as indicated by Table III.Q-6. The remaining peak flow capacity of the Candlestick tunnel sewer with the Project would be 28,035 gpm (design capacity less existing peak flow less Project peak flow contribution). This number does not take credit for the existing uses that would be demolished with implementation of the Project and would no longer contribute wastewater and stormwater flows to the Candlestick tunnel sewer, which means that the actual remaining peak flow capacity of the Candlestick tunnel sewer would be somewhat greater than 28,035 gpm.

The Hunters Point tunnel sewer has an existing average dry-weather flow of 6 mgd (4,167 gpm) and a design capacity of 120 mgd (83,333 gpm).[1025] Existing maximum peak flow in the Hunters Point tunnel sewer is estimated at 12,501 gpm (average daily flow times peaking factor). Projected maximum peak flows from Candlestick Point into the Hunters Point tunnel sewer, based on a peaking factor of 3.0, would be approximately 979 gpm, as indicated by Table III.Q-6. The design capacity of the Hunters Point tunnel sewer is 83,333 gpm. With the development of Candlestick Point, the Hunters Point tunnel sewer would have a remaining capacity of 69,853 (83,333 gpm design capacity less 12,501 gpm existing peak flow gpm less 979 gpm from Candlestick Point development) during peak dry-weather flow conditions. Therefore, the addition of approximately 979 gpm peak flow from the Candlestick Point development would be accommodated within the remaining capacity of the Hunters Point tunnel sewer.

[1025] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.

The contribution of 1,479 gpm from the Candlestick Point development represents only 5 percent (1,479 gpm/29,514 gpm available capacity) of the available design capacity of the Candlestick tunnel sewer and 2 percent (1,479 gpm/70,832 gpm available capacity) of the Hunters Point tunnel sewer. This is a small percentage that could be accommodated by the existing infrastructure. No expansion of the existing off-site conveyance infrastructure would be required to accommodate wet-weather flows with the Project's contribution. As the existing conveyance infrastructure could accommodate the additional flows from the Candlestick Point development in addition to existing flows even during periods of peak flow conditions, no expansion of the off-site wastewater conveyance lines would be required as a result of development at Candlestick Point. The impact would be less than significant, and no mitigation is required.

Wet-Weather Conditions

While Project development at Candlestick Point would no longer contribute stormwater to the Combined Sewer System, Project wastewater discharges during wet weather would combine with off-site wet-weather flows and contribute to overall wet-weather discharge volume in the system. If wet-weather volumes were to exceed the capacities of the available conveyance facilities, a CSO could occur.

The Technical Memorandum prepared by Hydroconsult Engineers (Appendix Q3) analyzed the potential impact of the Project on wet-weather flows and CSO events. Model results included the frequency, volume, and duration of CSO from the Yosemite Basin, the only basin that would be impacted by the proposed development, and the total CSO volume for the entire Bayside. Based on Project acreages, Hydroconsult calculated a baseline of 5.3 million gallons per year CSO for the Yosemite Basin (based on one event per year) and a total Bayside CSO of 890 million gallons per year. The analysis determined that future sanitary flows from Candlestick Point to the City's Combined Sewer System would increase slightly, by 0.518 mgd, due to the new development. However, the separate wastewater and stormwater systems would result in a *decrease* in CSO volume, frequency, and duration of CSO in the Yosemite Basin (3.1 million gallons per year compared to the baseline of 3.1 million gallons per year) and decrease in overall CSO volume for the entire Bayside Drainage Area from 890 million gallons per year to 877 million gallons per year because stormwater from the Project site would no longer flow into the Combined Sewer System. The proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows. Based on this analysis, the overall flows in the Bayside system during wet weather would be less than existing conditions with implementation of the Candlestick Point development. It is possible that a temporary increase in CSO volume could occur during wet weather if Project structures are occupied and contribute wastewater prior to completion of the Project's separate stormwater and wastewater infrastructure. To reduce this impact, the following mitigation measure shall be implemented:

MM UT-3a *Wet-Weather Wastewater Handling. Prior to approval of the Project's wastewater infrastructure construction documents for any new development, the Project Applicant shall demonstrate to the San Francisco Public Utilities Commission (SFPUC), in writing, that there will be no net increase in wastewater discharges during wet-weather conditions from within the Project Area boundary to the Bayside System compared to pre-Project discharges. This may be accomplished through a variety of means, including, but not limited to:*

- *Temporary on-site retention or detention of flows to the system*
- *Separation of all or a portion of the stormwater and wastewater system at Candlestick Point*

The contribution of the Candlestick Point development to the Bayside system represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development at Candlestick Point would increase wastewater flows (as intermittent flows from Candlestick Park stadium would be replaced by year-round flows from mixed-use development), the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System. Mitigation measure MM UT-3a would ensure that there would be no net increase in wet-weather flows in the Combined Sewer System as a result of the Project that could result in a temporary increase in CSO volume. During wet weather, the temporary retention or detention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project would ensure that there would be no increase in the likelihood of a CSO event as a result of the Project. The impact on the Combined Sewer System would be reduced to less than significant.

Impact of Hunters Point Shipyard Phase II

Impact UT-3b **Implementation of the Project at HPS Phase II would not require expansion of existing off-site wastewater conveyance facilities. (Less than Significant with Mitigation)** ***[Criterion Q.d]***

Dry-Weather Conditions

HPS Phase II is served by separate wastewater and stormwater systems, and existing wastewater flows from this area are minimal, as sewage lines are no longer in use within HPS Phase II. Thus, HPS Phase II does not currently contribute substantial wastewater to the Combined Sewer System. Based on meter data from January 2000 to August 2002, the HPS Phase II site generated an average of 0.154 mgd (106.9 gpm) of wastewater flow. Thus, the majority of the HPS Phase II does not currently contribute notable wastewater to the Combined Sewer System.

Based on estimated potable water use and the generation factors described, above, development at HPS Phase II would generate approximately 0.6 mgd of wastewater flows during operation. Wastewater generated at HPS Phase II would be transported via the new or expanded conveyance systems within the Project site and existing mains to the SWPCP.[1026] Wastewater from the HPS Phase II site flows into the Hunters Point tunnel sewer. The Hunters Point tunnel sewer has an existing average dry-weather flow of 6 mgd (4,167 gpm) and a design capacity of 120 mgd (83,333 gpm).[1027] Existing maximum peak flow in the Hunters Point tunnel sewer is estimated at 12,501 gpm (average daily flow times peaking factor). Projected maximum peak flows from HPS Phase II into the Hunters Point tunnel sewer, based on a peaking factor of 3.0, would be approximately 979 gpm (0.47 mgd/24 hours/60 minutes x 1,000,000 times 3.0). The design capacity of the Hunters Point tunnel sewer is 83,333 gpm. With the Project, the Hunters Point tunnel sewer would have a remaining capacity of 69,853 gpm during peak dry-weather flow conditions. Therefore, the addition of approximately 979 gpm peak flow from the HPS Phase II development would be accommodated within the remaining capacity of the Hunters Point tunnel sewer.

[1026] *Candlestick Point/ Hunters Point Shipyard Infrastructure Concept Report* (June 30, 2009, revised July 22, 2009) prepared by Winzler & Kelly Consulting Engineers.
[1027] City and County of San Francisco, Public Utilities Commission, Bayside Systems and Facilities Operations Plan, 2002.

The contribution of 979 gpm from the HPS Phase II development represents only 1.2 percent of the total design capacity of the tunnel. This is a negligible percentage, and flows from the HPS Phase II site would be accommodated by the existing infrastructure. No expansion of the existing off-site conveyance infrastructure would be required to accommodate dry-weather flows with the contribution from development at HPS Phase II. As the existing conveyance infrastructure could accommodate the additional flows from the HPS Phase II development in addition to existing flows even during periods of peak flow conditions, no expansion of the off-site wastewater conveyance lines would be required as a result of HPS Phase II. The impact would be less than significant and no mitigation is required.

Wet-Weather Conditions

While Project development at HPS Phase would not contribute stormwater to the Combined Sewer System, Project wastewater discharges during wet weather would combine with off-site wet-weather flows and contribute to overall wet-weather discharge volume in the system. If wet-weather volumes were to exceed the capacities of the available conveyance facilities, a CSO could occur.

The Technical Memorandum prepared by Hydroconsult Engineers (Appendix Q3) analyzed the potential impact of the Project on wet-weather flows and CSO events. Hydroconsult determined that future sanitary flows from the HPS Phase II development to the City's Combined Sewer System would increase slightly by 0.236 mgd. However, the results of hydrologic modeling assuming the proposed separate wastewater and stormwater systems indicate a *decrease* in CSO volume, frequency, and duration of CSO in the Yosemite Basin and a decrease in overall CSO volume for the entire Bayside Drainage Area because stormwater from the Project site would no longer flow into the Combined Sewer System. The proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows. In addition, mitigation measure MM UT-3a would ensure that there would be no increase in CSO flows as a result of the Project by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. The impact on the Combined Sewer System would be reduced to less than significant.

Combined Impact of Candlestick Point and Hunters Point Shipyard Phase II

Impact UT-3 **Implementation of the Project would not require expansion of existing off-site wastewater conveyance or treatment facilities. (Less than Significant with Mitigation)** ***[Criterion Q.d]***

Wastewater Conveyance

Dry-Weather Conditions

The Candlestick Point development would discharge a maximum peak flow of 1,479 gpm to the Candlestick tunnel sewer, which has an existing unused capacity of 28,035 gpm in dry weather. This flow would combine with a maximum peak flow of 979 gpm from the HPS Phase II into the Hunters Point tunnel sewer. The total maximum peak Project flows of 2,458 gpm would combine in the Hunters Point tunnel sewer, which has an existing unused capacity of 69,853 gpm in dry weather. This represents 3.5 percent of the available capacity of the Hunters Point tunnel sewer, which could be accommodated by the existing off-site infrastructure.

Wet-Weather Conditions

Hydroconsult Engineers determined that the total net increase in wastewater from the Project site would equal 0.754 mgd, and that there would be a decrease in CSO volume, frequency, and duration of CSO in the Yosemite Basin and a decrease in overall CSO volume for the entire Bayside Drainage Area because stormwater from the Project site would no longer flow into the Combined Sewer System. The proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of the Project. It is possible that a temporary increase in CSO volume could occur during wet weather if Project structures are occupied and contribute wastewater to the Combined Sewer System prior to completion of the Project's separate stormwater and wastewater infrastructure. Mitigation measure MM UT-3a would ensure that there would be no increase in CSO flows as a result of the Project by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. The impact on the Combined Sewer System would be reduced to less than significant.

Wastewater Treatment

Based on estimated potable water use and utilizing the percentage factors as described in Table III.Q-5, development at Candlestick Point would generate approximately 0.71 mgd of wastewater. Development of HPS Phase II would generate approximately 0.47 mgd of wastewater. The SWPCP currently treats approximately 67 mgd during dry-weather conditions and has a capacity to treat 150 mgd to the secondary treatment standard. The net increase in dry-weather wastewater flows with the Project would represent only 1.4 percent of the remaining dry-weather treatment capacity (1.18 mgd/83 mgd) and 0.8 percent of the overall treatment capacity of the SWPCP (1.18 mgd/150 mgd).

The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the Project development. As noted, overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows, assuming completion of Project utility infrastructure prior to Project occupancy. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of the Project. It is possible that a temporary increase in CSO volume could occur (which could affect the capacity of the SWPCP for treatment) during wet weather, as noted, above. Mitigation measure MM UT-3a would reduce this impact to less than significant by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. Thus, the Project would not result in any net increase in CSO volume in the Bayside system during wet weather. A less-than-significant impact to existing off-site treatment facilities would occur.

Impact UT-4: Wastewater Treatment Requirements of the RWQCB

Impact UT-4 **Implementation of the Project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (Less than Significant)** ***[Criterion Q.e]***

As discussed in Impact UT-3 above, the Project development would incrementally contribute wastewater during dry and wet-weather events to the Combined Sewer System operated by the SFPUC, but overall, wet-weather volumes would decrease in the Bayside system with construction of the Project's separate stormwater and wastewater systems. The SWPCP, the NPWWF, and the BWWF are required to comply with the WDRs set by the RWQCB, which specify the discharge requirements for those facilities.

As discussed in the Regulatory Framework above, the NPDES permit system requires that all existing and future municipal and industrial discharges to surface waters within the City be subject to specific discharge requirements. Wastewater from the Project would be treated at the SWPCP wastewater treatment plant and BWWF. The SFPUC, which operates the SWPCP wastewater treatment plant and BWWF, is required to comply with permit requirements set by the RWQCB, which specify the discharge requirements for the facility. These extensive requirements are codified in Order No. R2-2008-0007 for NPDES Permit No. CA0037664 and prohibit, among other things, exceedance of dry-weather flow of 84.5 mgd and discharge of any untreated wastewater to any waters of the United States, including the Bay. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that the Project would not exceed the applicable wastewater treatment requirements of the RWQCB. In addition, the Project would not cause the City to exceed the requirements of the NPDES permit for the reasons previously stated and because the flows during wet weather would actually decline compared to existing flows from the Project site. This impact would be less than significant. No mitigation is required.

Cumulative Impacts

The geographic context for an analysis of cumulative impacts to wastewater treatment and conveyance facilities is the wasteshed that utilizes the Candlestick Point and Hunters Point tunnel sewers and contributes wastewater to the SWPCP and potentially the NPWWF and BWWF during wet weather. The past and present development in the City is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. For wastewater conveyance, reasonably foreseeable development includes future projects that would be served by the Bayside Transport/Storage System, as described in Section III.Q.5 of this section. For wastewater treatment, the cumulative projects would include all reasonably foreseeable future development in the Bayside Drainage Area that would utilize the SWPCP, NPWWDF, and BWWF.

Wastewater Conveyance Capacity

Cumulative projects in the Bayside Drainage Area would contribute both additional wastewater and additional stormwater to the Bayside System, which could exceed its capacity. As noted above, the Bayside Systems and Facilities Operations Plan is intended to implement strategies to meet the objectives expressed in the Plan, which include maximizing the volume of wastewater treated at the SWPCP or NPWWF consistent with their capacities. Any cumulative projects that would result in wastewater and/or stormwater

flows that exceed the capacity of the Bayside system would be inconsistent with the objectives of the Operations Plan and would result in a potentially significant impact on wastewater conveyance.

The Project would construct a separate stormwater and wastewater system on site and would only contribute wastewater to the Bayside System. Peak-flow capacities of the Bayside System are adequate to convey the wastewater generated by the Project, which would only represent 3.5 percent of the remaining available capacity of the Bayside conveyance system. Wet-weather flow volumes would be reduced compared to existing conditions because the stormwater that currently flows from the Project site into the combined system would be offset by the proposed separated stormwater and wastewater system on site. Because there would be adequate dry-weather conveyance capacity to transport wastewater from the Project and because the total wet-weather volume in the Bayside system with the Project would be less than under current conditions, it would have no impact and, regardless of future contributions to CSOs from other projects, the Project's contribution would not be cumulatively considerable. Mitigation measure MM UT-3a would ensure that there would be no increase in CSO flows as a result of the Project by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. The Project's cumulative impact would be less than significant.

Wastewater Treatment Capacity

Wastewater from the Project site is treated at the SWPCP. The SWPCP has a design capacity of 150 mgd to secondary treatment standards, with the ability to treat an additional 100 mgd during wet weather to primary treatment standards. The SWPCP currently processes an average flow of 67 mgd, with a remaining secondary treatment capacity of 83 mgd. Cumulative projects in the wastershed would contribute to the overall demand for wastewater treatment by the SWPCP.

The SWPCP can accommodate the maximum additional 1.18 mgd of wastewater generated by the Project without requiring any expansion of existing facilities. Development of cumulative projects within the wasteshed, including the Project, is not expected to generate additional quantities of wastewater beyond the current capacity of the SWPCP. The existing and future wastewater flows in combination with Project flows would not exceed the capacity of existing infrastructure and would not require or result in the construction of new or expanded wastewater conveyance facilities or expansion of existing facilities, other than those on site, for which construction impacts have been comprehensively analyzed in this EIR. Therefore, the Project's cumulative impact would be less than significant.

Compliance with Waste Discharge Requirements

The NPDES permit system requires that all existing and future municipal and industrial discharges to surface waters within the City of San Francisco be subject to specific discharge requirements. The Project would not result in the discharge of untreated wastewater to any surface waters. Operational discharges would be sent through the Project's on-site sewer system that connects to the City's Combined Sewer System. Wastewater generated at the Project site would ultimately be treated at the SWPCP. The SWPCP is required to comply with its associated waste discharge requirements, which set the levels of pollutants allowable in water discharged from any facility. Related projects would be required to follow all local and regional rules and regulations pertaining to wastewater treatment compliance. Consequently, there would be no cumulative problem to which the Project could contribute. The Project's cumulative impact would be less than significant with regard to compliance with waste discharge requirements.

Solid Waste[1028]

III.Q.8 Setting

Collection, Transfer, and Disposal

Municipal solid waste collection, recycling, and disposal within the City is managed by SF Recycling Incorporated, a private company and subsidiary of Norcal Waste Systems, Incorporated. Residential and commercial solid waste generated at the Project site is collected by Sunset Scavenger Company, which delivers it to the SF Recycling Center. There, the solid waste stream is sorted to remove recyclables and organic materials. Organic waste is sent to the Jepson Prairie composing facility, which has the capacity to process approximately 300 tons per day, or approximately 5,200 tons of food waste (food scraps) from commercial premises and 2,000 tons of green waste per month.

Municipal solid waste remaining after sorting is currently transported to the Altamont Landfill in Livermore. Altamont Landfill serves a number of jurisdictions, including several East Bay cities such as Oakland, Alameda, Emeryville, and Richmond; however, San Francisco is the largest single contributor to the landfill. In 1988, the City of San Francisco entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste at Altamont. Through August 1, 2009, the City has used 12,579,318 tons of this capacity. The City projects that the remaining capacity would be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[1029]

The City has issued a Request for Qualifications to solicit bids for a new contract to accommodate the City's disposal capacity beyond the expiry of the current agreement. The City has identified three landfills that have the capacity to meet the City's future needs and is in the final stages of the selection process that will result in an agreement for ratification by the Board of Supervisors no later than early 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs.

In 2007, the volume of waste contributed by San Francisco represented approximately 41 percent of the total waste interred at this facility. The landfill's total capacity is 62 million cubic yards, of which 73.7 percent (45.7 million cubic yards) is remaining as of August 2009.[10301031] According to the California Integrated Waste Management Board (CIWMB) Solid Waste Information (SWIS) database, the landfill would reach capacity in January 2032 if disposal continues at current rates; however, the Altamont Landfill is currently scheduled for closure on January 1, 2029.[1032]

[1028] Hazardous wastes are discussed in Section III.K (Hazards and Hazardous Materials).
[1029] E-mail communication with David Assman, City of San Francisco, Department of the Environment, October 19, 2009.
[1030] California Integrated Waste Management Board, 2009. *Active Landfill Profile for Altamont Landfill & Resource Recovery (01-AA-0009).* Available online at: <http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=1&FACID= 01-AA-0009> (accessed August 24, 2009).
[1031] Landfill capacity is measured in cubic yards, since landfill capacity is more a function of volume than weight. Densities of constituents of municipal solid waste vary, while municipal solid waste is tracked in tons. For purposes of this analysis, known densities of materials types are utilized to calculate the amount of solid waste that the City contributes to the Altamont Landfill in cubic yards.
[1032]. Phone communication with David Assman, City of San Francisco, Department of the Environment. August 11, 2009.

Hazardous Waste Disposal

Refer to Section III.K for a full discussion of the regulatory framework for the handling, transport, and disposal of hazardous materials in California. Section III.K also analyzes safety risks as a result of handling, transport, or disposal of hazardous materials. This section focuses on hazardous waste disposal capacity.

Hazardous waste in the Bay Area is treated by registered Treatment, Storage, and Disposal facilities (TSDs). Several counties in the Bay Area have TSDs. For example, Alameda County has considerable hazardous waste treatment capacity (99,280 tons), between Evergreen Oil in Newark and AERC of Hayward. Marin County has one TSD, Photo Waste Recycling. San Mateo County has one large TSD. Santa Clara County has six TSDs. The City and County of San Francisco have no TSDs. In 2006, no San Francisco hazardous waste generators exported over 1,000 tons of hazardous wastes.[1033] However, in 2007, 44,222 tons of inorganic solid wastes (likely lead-contaminated building materials and soil) were removed from the Presidio, a former military base. The hazardous wastes generated in San Francisco in 2007 totaled 50,214 tons, an unusually large number because of the activities at the Presidio.

There is no State agency that establishes a ceiling on the amount that a hazardous waste treatment facility can process in a year, although some treatment facilities are regulated by Air Quality Management District Permits, which may limit capacity. All regional TSDs have capacity that exceeds the actual amounts of wastes that they treat.[1034] However, it should be noted that the treatment processes locally available do not match the treatment processes needed (these processes may include combustion or incineration, which is used to destroy hazardous organic constituents and reduce the volume of waste, disposal of liquid hazardous waste in underground injection wells) in the region. Therefore, many tons of hazardous waste are treated either elsewhere in California or other states. The Bay Area Hazardous Waste Management Facility Allocation Committee has determined that the prohibitive costs of siting a new hazardous waste treatment facility make it unlikely that a new facility would open in the Bay Area, but notes that Evergreen Oil has recently expanded its recycling capacity.

In 2007, waste generators in the nine counties of the Bay Area transported 568,156 tons of hazardous waste for off-site treatment. Of this amount, 305,594 tons (slightly over half) were "industrial wastes." The remainder included one-time wastes such as asbestos or contaminated soils, or may have been double-counted. The most common wastes generated in 2007 from the Bay Area included inorganic solids (such as lead paint waste or refining wastes), waste oil, and waste solvents. Of the 305,594 tons, roughly 17 percent (51,650 tons) was treated in the Bay Area, 79 percent was treated in California, and the remainder went to Utah and Nevada.

For household hazardous waste, SF Recycling & Disposal, Inc. operates a permanent facility for residents to safely dispose of the hazardous waste generated from their homes. The most common wastes received are leftover paint, motor oil from cars, thinners, spray cans, and old garden products, such as pesticides and fertilizers. SF Recycling & Disposal also operates the Artist-In-Residence Program, which uses art to

[1033] Bay Area Hazardous Waste Management Facility Allocation Committee, *Hazardous Waste Generation and Treatment Trends, San Francisco Bay Area, 2006 and 2007 Manifest Data*, May 2009.
[1034] Bay Area Hazardous Waste Management Facility Allocation Committee, *Hazardous Waste Generation and Treatment Trends, San Francisco Bay Area, 2006 and 2007 Manifest Data*, May 2009.

inspire people to recycle more and conserve natural resources. The company provides selected local artists with the opportunity to create art using materials they gather from San Francisco's refuse.

Construction Waste

Under the City and County of San Francisco's Construction and Demolition (C&D) Ordinance, effective July 1, 2006, at least 65 percent of C&D debris (such as wood, metal, concrete, asphalt, and sheetrock) taken from a site must go to a registered construction recycling facility and cannot go to a landfill. This mandatory ordinance maximizes the recycling of mixed construction and demolition debris and applies to all commercial and residential indoor and outdoor construction projects, including repairs, improvements, additions, remodeling, and demolitions. The ordinance also requires that all mixed C&D debris, transported off site, must be hauled by a registered transporter, and be taken to a registered facility that can process mixed C&D debris, thereby diverting a minimum of 65 percent of the material from landfill. SF Recycling & Disposal operates a registered facility specifically designed to recycle construction debris. Similarly, Section 1304C.1.3.4 of the City's Green Building Ordinance, which was effective January 1, 2009, requires documentation to ensure that at least 75 percent of a Project's construction debris is diverted).

Recycling and Diversion

Waste Generation and Diversion Trends

According to the CIWMB, San Francisco households generate approximately one pound of solid waste per resident per day, while commercial uses generate approximately 4.7 pounds per employee per day.[1035] In 2008, the City produced approximately 594,732 tons of solid waste altogether.[1036]

Approximately 72 percent of the City's total waste stream, by volume, was diverted in 2008.[1037] Of the wastes that were not diverted, the City estimates that up to 65 percent of the total volume consists of readily recyclable or compostable materials, such as paper and food scraps.[1038] The remainder of the wastes consists of materials such as disposed household items and furniture, hazardous wastes, and construction wastes. The City has prepared a number of strategies, discussed below, to divert additional solid waste and achieve citywide diversion goals.

Zero Waste Strategies

The City plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020 (refer to Regulatory Framework, below). The City encourages residents and businesses to pre-sort recyclables, compostable wastes (food scraps and yard waste), and garbage into separate curbside collection

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[1035] California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Accessed online at: <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco> (accessed November 5, 2008).

[1036] http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile2.asp?RG=C&JURID=438&JUR=San+Francisco (accessed October 18, 2009).

[1037] This figure is a preliminary estimate and represents the most recent data available. California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Accessed online at: <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID=438&JUR=San +Francisco> (accessed November 5, 2008).

[1038] City of San Francisco, *Waste Characterization Study: Final Report.* 2008.

containers; sponsors regular public outreach events to educate San Francisco residents and businesses about waste diversion techniques; and conducts special collection events for wastes that are not generally recyclable at curbside (e.g., batteries, electronics, hazardous wastes). For municipal operations, City departments participate in a sustainable purchasing program that encourages the purchase of recyclable materials. The City also sponsors grants for waste-diversion research and works with businesses to create market opportunities for materials reuse and recapture. Local waste management providers have upgraded sorting and transfer facilities to maximize the volume of material diverted. On June 9, 2009, the City Board of Supervisors approved an ordinance that would make recycling and composting mandatory for residential and commercial uses. These and similar strategies would be utilized to achieve the City's overall waste reduction goals.

Existing Project Site Solid Waste Generation

Based on CIWMB solid waste generation factors, residential and commercial uses at Candlestick Point currently generate approximately 1,469 tons of solid waste annually.[1039] Events at Candlestick Park stadium generate approximately 74 tons of solid waste per event[1040] for a total estimated generation of approximately 1,038 tons annually (assuming fourteen sold-out events per year). The existing Hunters Point Shipyard artists' studios generate approximately 274 tons of operational solid waste annually.[1041] Current total solid waste generation from the Project site is approximately 2,781 tons annually, approximately 0.4 percent of the City's annual solid waste generation of approximately 594,732 tons per year in 2008.

III.Q.9 Regulatory Framework

Federal

With the exception of determining where disposal sites are located and operational standards, there are no applicable federal laws, regulations, or policies that pertain to solid waste.

State

At the state level, the management of solid waste is governed by regulations established by the CIWMB, which delegates local permitting, enforcement, and inspection responsibilities to local enforcement agencies. In 1997, some of the regulations adopted by the SWQCB pertaining to landfills (Title 23, Chapter 15) were incorporated with CIWMB regulations (Title 14) to form Title 27 of the California Code of Regulations (CCR).

[1039] The square footage of existing uses is not known; therefore, per employee generation factor is used. Calculated according to the following formula using solid waste generation factors from CIWMB, 2008: [1,113 residents (5 lbs/day) + 529 employees (4.7 lbs/day)] (365 days/year) divided by 2000 lbs/ton.
[1040] Calculated according to a waste generation factor of 2.23 pounds per seat, adjusted for a 5 percent "no show" factor (95 percent of 70,000 seats), then divided by 2000 lbs per ton and multiplied by 14 annual events, as described in Table III.Q-8 (Project Solid Waste Generation).
[1041] Calculated according to the following formula using waste generation factors from CIWMB, 2008: [300 persons (5 lbs/day)(365 days/year)] divided by (2000 lbs/ton).

California Integrated Waste Management Act

In 1989, the Legislature adopted the *California Integrated Waste Management Act of 1989*, which established an integrated waste management hierarchy that consists of the following approaches in order of importance: (1) source reduction, (2) recycling and composting, and (3) environmentally safe transformation and land disposal. The law also required that each county prepare a new Integrated Waste Management Plan. The Act further required each city to prepare a Source Reduction and Recycling Element (SRRE) by July 1, 1991. Each SRRE includes a plan for achieving a solid waste goal of 25 percent by January 1, 1995, and 50 percent by January 1, 2000 (based on a 1989 baseline). A number of changes to the municipal solid waste diversion requirements under the Integrated Waste Management Act were adopted, including a revision to the statutory requirement for 50 percent diversion of solid waste. Under these provisions, local governments were required to divert at least 50 percent of all solid waste on and after January 1, 2000. Some progress has been made. Under Project Recycle, the number of state facility recycling programs has increased from 150 in 1991 to more than 1,800 today; and the amount of material recycled during this period has expanded from 2,000 tons a year to more than 63,000 tons a year. Nevertheless, the overall level of performance trails far behind the percentages of local jurisdictions striving to meet the requirements of the Act. To address this need, 1999 legislation established state agency diversion mandates of 25 percent in 2002 and 50 percent in 2004, requiring each agency to also adopt an integrated plan to achieve the mandates. The CIWMB is now assisting agencies in developing their plans. The CIWMB is the driving force behind the state's Green Building Task Force, whose goal is to institutionalize sustainable building practices as part of state construction projects in an efficient, practical, and cost-effective manner.[1042]

Local

San Francisco Board of Supervisors Resolution Number 679-02

Resolution 679-02, adopted by the San Francisco Board of Supervisors in September 2002, adopted a citywide landfill diversion goal of 75 percent by the year 2010 and a long-term zero waste (100 percent diversion) goal. The San Francisco Department of the Environment passed Resolution 002-03-COE in March 2003, setting a target date of 2020 for achieving zero waste.

Construction and Demolition Debris Recovery Ordinance

Projects that require demolition of an existing structure must submit a waste-diversion plan to the Director of the San Francisco Department of the Environment as required by the City's Construction and Demolition Debris Recovery Ordinance (Ordinance 27-06, Chapter 14, *San Francisco Environment Code*). The waste-diversion plan must demonstrate that 65 percent or more of the total construction and demolition debris produced as the result of the Project (such as wood, metal, concrete, asphalt, and sheetrock) is diverted from landfill interment.

Green Building Ordinance

On August 5, 2008, the City adopted the *San Francisco Building Code* (SFBC), Chapter 13C, "green building codes" for new construction and for renovations of existing structures, consistent with the GHG reduction

[1042] http://www.calepa.ca.gov/about/history01/ciwmb.htm. Accessed September 30, 2009.

measures in the SFCAP. The new green building standards in SFBC Chapter 13C are to be phased in by 2012. At 2012, the ordinance specifically requires newly constructed commercial buildings over 5,000 square feet (sf), residential buildings over 75 feet in height, and renovations on buildings over 25,000 sf, to be subject to LEED® Gold (or an equivalent standard), which makes San Francisco the city with the most stringent green building requirements in the nation. The ordinance identifies cumulative benefits through the year 2012 which include reducing construction and demolition waste by 700 million pounds and increasing the valuations of recycled materials by $200 million.

New projects would be evaluated on a point system, with credit given for materials used in the building, the location of the building site, and water and energy efficiencies. The new codes focus on water and energy conservation, recycling, and reduction of carbon emissions. They apply to most buildings in the City, including residential projects of all sizes, new commercial buildings, and renovations of large commercial spaces. Large residential and commercial buildings would be evaluated under the Leadership in Energy and Environmental Design (LEED)® or GreenPoint Rated green building certification rating system. Medium and small residential construction would use the GreenPoint rating system, which is less stringent.

Mandatory Recycling and Composting Ordinance

In June 2009, the San Francisco Board of Supervisors passed Ordinance 100-09, a universal recycling and composting ordinance that requires all residences and commercial businesses in San Francisco to separate their refuse into dedicated bins for recyclables, compostables, and trash. This ordinance adds Chapter 19, Sections 1901 through 1912, and is entitled Mandatory Recycling and Composting Ordinance, amending the *San Francisco Public Works Code* by amending Sections 291, 291.1, 291.2, 291.4, 291.7, 291.11, 291.12, 291.15, 291.17, and 293.1, and by repealing current Sections 291.9 and 291.16 and adding a new Section 291.16, providing enforcement mechanisms and penalties for violations. According to the ordinance, recyclables, compostables, and trash may not be mixed in a single bin or placed in a bin designated for another form of refuse. Building owners or managers are required to maintain appropriate, color-coded, labeled containers in convenient locations, and educate tenants, employees, and contractors, including janitors, on how to separate materials. Failure to comply with these policies would result in fines; however, fines would not be assessed until 2011, allowing for gradual implementation of the new program.

Waste Disposal Agreement, Altamont Landfill and Resource Recovery Facility

The City has an agreement with the Altamont Landfill, the primary landfill serving the City, to match or exceed the waste-diversion thresholds required in Alameda County. The Alameda County Integrated Waste Management Plan (Goal 2, Objective 2.1) has a diversion goal of 75 percent of the solid waste generated within its municipalities by 2010.

San Francisco General Plan

The *San Francisco General Plan* contains the following policies within the Community Facilities chapter relating to solid waste:

Objective 10 Locate solid waste facilities in a manner that will enhance the effective and efficient treatment of solid waste.

III.Q.10 Impacts

Significance Criteria

The CCSF and Agency have not formally adopted significance standards for impacts associated with solid waste, but generally consider that implementation of the Project would have significant impacts on these resources if it were to:

Q.f Be served by a landfill with insufficient permitted capacity to accommodate Project-related solid waste disposal needs

Q.g Fail to comply with federal, state, and local statutes and regulations related to solid waste

Analytic Method

To determine the amount of solid waste generated by the Project, solid waste generation factors identified by the CIWMB are applied to the Project's land uses. Construction-related solid waste results from demolition of existing structures and infrastructure (including asphalt and concrete) and waste from excess building materials. To determine solid waste impacts associated with implementation of the Project, estimated future solid waste generation amounts are compared to the total anticipated remaining capacity at the Altamont Landfill to determine whether adequate capacity exists. The baseline year for purposes of the solid waste analysis is 2009, which is when data for the Altamont Landfill were collected from the CIWMB. The Project is further analyzed for its compliance with statutes and regulations related to solid waste.

Construction Impacts

Impact UT-5: Construction Solid Waste and Permitted Landfill Capacity

Up to 37,500 tons of solid waste would be produced during construction of new buildings and infrastructure. As shown in Table III.Q-7 (Estimated Demolition Debris), it is estimated that approximately 876,195 tons of construction waste would be produced during building demolition and 95,590 tons of construction waste would be produced during road demolition (these data include off-site infrastructure improvement debris). A total of 971,785 tons of construction waste would be produced during building and road demolition over the Project build-out period.

Impact of Candlestick Point

Impact UT-5a **Construction at Candlestick Point, including demolition of existing facilities, would not generate construction-related solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

- It is anticipated that the Project would be constructed in phases beginning in 2011, with full build-out by 2031, which represents an approximately 20-year construction period; however, as indicated by Figure II-16 (Proposed Site Preparation Schedule), all demolition activities would be concluded by 2028 in Candlestick Point.

Construction debris would be generated by the demolition and removal of existing structures and utility infrastructure at Candlestick Point and the construction of new residential and commercial space and associated infrastructure. Construction of the Candlestick Point development would generate approximately 424,681 tons of mixed construction debris over the construction period, or approximately 44 percent of total Project C&D debris.

Table III.Q-7 Estimated Demolition Debris

	Concrete/Asphalt[a] (tons)	*Wood[b] (tons)*	*Steel[c] (tons)*	*Misc. Debris[d,e] (tons)*	*Total[f] (tons)*
Candlestick Point					
Building Demolition	212,361	26,611	104,250	55,150	398,372
Road Demolition	2,021	0	33	24,255	26,309
Subtotal	*214,382*	*26,611*	*104,283*	*79,405*	*424,681*
Hunters Point Shipyard Phase II					
Building Demolition	179,652	137,572	74,480	86,119	477,823
Road Demolition	36,950	0	0	32,331	69,281
Subtotal	*216,602*	*137,572*	*74,480*	*118,450*	*547,104*
Total	***430,984***	***164,183***	***178,763***	***197,855***	***971,785***

SOURCE: Lennar Urban, 2009.

a. Concrete/asphalt debris can be sized and recycled on site as pipe bedding or road base.
b. Wood debris can be chipped and sent to the local landfill for disposal.
c. Scrap steel can be recycled off site.
d. Miscellaneous debris including glass, asphalt, plastic, etc would be transported and disposed of at a local landfill.
e. Asphalt included in Miscellaneous Debris may be recycled.
f. Quantity estimates are approximate. Pre-demolition surveys need to be performed to confirm size of structures and building material types.

Sustainable construction practices are an important part of the Project's overall waste management strategy. The Project Applicant has balanced cut and fill on the site to the maximum extent feasible to minimize the need to dispose of excavation materials off site. The use of imported topsoil would be minimized by utilization of green waste and site-based soils to create topsoil. Modern methods of construction and off-site manufacturing would be used to eliminate waste. The Project would also implement a system for the production of secondary aggregate from inert C&D waste in a manner that conforms to the requirements of local standards and processors of inert C&D waste.

In order to reduce the amount of construction waste generated by the Project and diverted in landfills, a Waste Diversion Plan shall be prepared. The Waste Diversion Plan would include a process to measure the types and quantities of waste produced and include requirements for regular monitoring of performance against waste reduction and recovery targets by the Project Applicant or an appointed site waste management contractor. Each of these strategies, and/or other suitable strategies, would be implemented through mitigation measure MM UT-5a, which requires that 75 percent of construction waste is diverted from landfill(s):

MM UT-5a *<u>Construction Waste Diversion Plan.</u> The Project Applicant shall submit a Construction Waste Diversion Plan to the Director of the San Francisco Department of the Environment demonstrating a plan to divert at least 75 percent of or more of the total construction and demolition debris produced as*

> *the result of the Project (such as wood, metal, concrete, asphalt, and sheetrock) from landfill interment, which is required by the City's Green Building Ordinance. The Plan shall be submitted and approved by the Director of the San Francisco Department of the Environment before the issuance of building permits. This Plan shall include (1) identification of how much material resulting from demolition of existing facilities could be reused on site (e.g., existing asphalt and concrete could be removed, crushed, reconditioned, and reused as base material for new roadways and parking lots); (2) the extent to which materials could be sorted on site (e.g., through piecemeal demolition of selected facilities to extract recyclable materials), (3) the amount of material that would be transported to an off-site location for separation; and (4) the amount of materials that cannot be reused or recycled and would be interred at a landfill, such as the Altamont Landfill in Livermore.*

Some construction and demolition debris would be reused on site (e.g., existing asphalt in parking areas would be removed, crushed, reconditioned, and reused as base material for new roadways and parking lots), while other materials would be transported off site for separation. SF Recycling & Disposal operates a registered facility specifically designed to recycle construction debris from the City. Even if no construction and demolition debris were to be reused on site, diverting 75 percent of construction solid waste pursuant to mitigation measure MM UT-5a would mean that approximately 318,511 tons of construction waste would be transported to SF Recycling & Disposal or other facilities, if needed, available to recycle construction debris. Approximately 106,170 tons of construction debris (over the entire construction period) that cannot be recycled would be transported to the Altamont Landfill. The remaining capacity of the Altamont Landfill as of August 2009 is 45.7 million cubic yards. At an average density of 1 ton per cubic yard,[1043] 106,170 tons would equal 106,170 cubic yards. The contribution from construction of the Candlestick Point development would represent 0.2 percent of the available remaining capacity.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, its permit expires three years earlier, in January 2029.[1044] Demolition activities, which generate construction debris, are expected to conclude in 2028 at Candlestick Point, one year before the landfill is expected to close. Further, the City requires the diversion of at least 75 percent of construction waste, as also required by mitigation measure MM UT-5a, which would reduce the amount of waste interred at the landfill. In total, the construction waste sent to Altamont Landfill from activities at Candlestick Point would represent only 0.2 percent of the landfill's remaining capacity. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Project on solid waste would be further reduced. The impact of construction waste generated by development of Candlestick Point on the capacity of the Altamont Landfill would be less than significant.

[1043] Densities of construction waste vary from between 400 pounds/cubic yard for wood material to 2400 pounds/cubic yard for loose asphalt and concrete Available online at:
<http://www.ciwmb.ca.gov/LEAtraining/Resources/CDI/Tools/Calculations.htm>, Accessed: August 24, 2009.
[1044] CIWMB, 2009.

Impact of Hunters Point Shipyard Phase II

Impact UT-5b **Construction at HPS Phase II, including demolition of existing facilities, would not generate construction-related solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

At HPS Phase II, new development would begin with the construction of the 49ers stadium, scheduled for completion during the 2014–2017, or alternately by 2022, time period.[1045] Demolition activities at the rest of HPS Phase II would begin in 2011 and conclude by 2028, as indicated by Figure II-16.

Construction debris would be generated by the demolition and removal of existing structures and utility infrastructure within the HPS Phase II site and the construction of new structures and infrastructure. The HPS Phase II component of the Project is estimated to generate approximately 547,104 tons of total construction debris, which represents approximately 56 percent of the total C&D debris that would be generated by the Project. Some construction and demolition debris would be reused on site (e.g., existing asphalt in parking areas would be removed, crushed, reconditioned, and reused as base material for new roadways and parking lots), while other materials would be transported off site for separation. Materials that cannot be reused or recycled are anticipated to be transported to the Altamont Landfill. At a 75 percent diversion rate, approximately 136,776 tons would be transported to the landfill.

The remaining capacity of the Altamont Landfill as of August 2009 is 45.7 million cubic yards. The estimated 136,776 tons of construction waste is equivalent to approximately 136,776 cubic yards at an average density of 1 ton per cubic yard.[1046] This represents approximately 0.3 percent of the available remaining capacity in the Altamont Landfill.

As noted, at current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1047] Most of the demolition activities, which generate construction debris, are expected to conclude in 2028 at HPS Phase II, six years before the landfill is expected to close. Further, the City requires the diversion of at least 75 percent of construction waste, as also required by mitigation measure MM UT-5a, which will reduce the amount of waste interred at the landfill. In total, the construction waste sent to Altamont Landfill from activities at HPS Phase II would represent only 0.3 percent of the landfill's remaining capacity. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Project on solid waste would be further reduced. The impact of the construction waste generated by HPS Phase II development on the capacity of the Altamont Landfill would be less than significant.

[1045] The 49ers have two five-year lease extension options. If exercised, they could remain in the stadium through May 2018 or May 2023. In order to have a seamless transition from the existing stadium to a new stadium at HPS Phase II, the new stadium should be constructed before their lease expires, by either 2017 or 2022.

[1046] Densities of construction waste vary from between 400 pounds/cubic yard for wood material to 2400 pounds/cubic yard for loose asphalt and concrete available online at:
<http://www.ciwmb.ca.gov/LEAtraining/Resources/CDI/Tools/Calculations.htm>, Accessed: August 24, 2009.

[1047] CIWMB, 2009.

Combined Impact of Candlestick Point and Hunters Point Shipyard Phase II

Impact UT-5 **Construction activities associated with the Project, including demolition of existing facilities, would not generate construction-related solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

It is anticipated that the Project would be constructed in phases beginning in 2011, with full build-out by 2031, which represents an approximately 20-year construction period; however, as indicated by Figure II-16, all demolition activities would be concluded by 2028 in both Candlestick Point and HPS Phase II.

Demolition of existing facilities within the Project site would generate approximately 971,785 tons of construction debris. Some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. With implementation of mitigation measure MM UT-5a, the Project Applicant would be required to submit a Waste-Diversion Plan demonstrating strategies to divert at least 75 percent of total construction wastes before receiving building permits. This would reduce construction debris transported to the landfill to 25 percent, or 242,946 tons. At an average density of 1 ton per cubic yard, this equals 242,946 cubic yards, or 0.5 percent of the available capacity at Altamont Landfill as of 2009.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1048] Demolition activities, which generate construction debris, are expected to conclude in 2028 at both Candlestick Point and HPS Phase II, a minimum of one year before the landfill is expected to close. Further, the City requires the diversion of at least 65 percent of construction waste, as also required by mitigation measure MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Project on solid waste would be further reduced. The impact of the construction waste generated by the Project on the capacity of the Altamont Landfill would be less than significant.

Impact UT-6: Hazardous Waste

Impact of Candlestick Point

Impact UT-6a **Construction at Candlestick Point would not require the disposal of hazardous wastes such as lead-based paint, asbestos, and contaminated soils that would exceed the capacity of transport, storage, and disposal facilities permitted to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

Construction activities at Candlestick Point, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently as construction occurs over the 20-year construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes (refer to Setting).

[1048] CIWMB, 2009.

Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. It is estimated that approximately 450,000 cubic yards of soil from Candlestick Point would require transportation off site (refer to Table II-12 [Summary of Project Site Grading Requirements] in Chapter II [Project Description]). At Candlestick Point, results of soil and groundwater sampling taken at depths of up to 15 feet detected organic compounds and metals at various depths and locations, indicating that chemicals were associated with fill materials. Therefore, some of the 450,000 cubic yards could be contaminated and require disposal under hazardous waste regulations.

Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of Candlestick Point would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact UT-6b **Construction at HPS Phase II would not require the disposal of hazardous wastes such as lead-based paint, asbestos, and contaminated soils that would exceed the capacity of transport, storage, and disposal facilities permitted to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

Construction activities at HPS Phase II, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently as construction of HPS Phase II occurs over a seven-year construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes (refer to Setting).

Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. At HPS Phase II, investigations have shown that chemicals and radioactive materials are present in soil and groundwater in various locations throughout the HPS Phase II site at levels that require remediation. It is anticipated that the Navy would transfer the property in phases, either as it completes remediation of a phase or as it agrees and get approval to transfer the property before full remediation is complete. If transferred under the latter scenario, it is anticipated that most remediation would be completed at the time of transfer and remaining work would involve groundwater treatment, limited soil excavation, placement of soil and building covers on the site, and monitoring. Contaminated soil or other materials generated as a result of these remediation efforts may require transportation off site to designated TSDs. Refer to Section III.K for an accurate description of work that would be done under an early transfer.

Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of HPS Phase II would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact, and no mitigation is required.

Combined Impact of Candlestick Point and Hunters Point Shipyard Phase II

Impact UT-6 **Construction activities associated with the Project would not require the disposal of hazardous wastes such as lead-based paint, asbestos, and contaminated soils that would exceed the capacity of transport, storage, and disposal facilities permitted to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

Construction activities, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently during the construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes (refer to Setting). Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. Contaminated soils may require transportation off site and treatment at authorized TSDs.

Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of the Project would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact, and no mitigation is required.

Operational Impacts

Impact UT-7: Operation Solid Waste and Permitted Landfill Capacity

Landfill capacity is a dynamic metric dependent on the amount of solid waste that requires disposal (and the effectiveness of source reduction and recycling methods), the permitted capacity of the landfills, and the number of landfills that can accommodate solid waste.

Table III.Q-8 (Project Solid Waste Generation) shows the projected operational solid waste generation for the Project. The Project would generate a total of approximately 21,827 tons of solid waste annually at full build-out (13,082 tons at Candlestick Point and 8,745 tons at HPS Phase II).

Table III.Q-8 Project Solid Waste Generation

		Candlestick Point			*HPS Phase II*			*Total*		
Use	*Generation Factor (per day)*	*Area or Units*	*Tons per Day or Event*	*Tons per Year*	*Area or Units*	*Tons per Day or Event*	*Tons per Year*	*Area or Units*	*Tons per Day or Event*	*Tons per Year or per Total Number of Events*[a]
Residential	5.653 lbs/unit	7,850 units	22.2	8,103	2,650 units	7.5	2,737.5	10,500 sf	29.7	10,840.5
Retail	0.02600411 lbs/sf	760,000 sf	9.9	3,613.5	125,000 sf	1.6	584.0	885,000 sf	11.5	4,197.5
Office	0.006 lbs/sf	150,000 sf	0.5	182.5	0	0	0	150,000 sf	0.5	182.5
Hotel	0.0108 lbs/sf	150,000 sf	0.8	292.0	0	0	0	150,000 sf	0.8	292.0
R&D	0.006 lbs/sf	0	0	0	2,500,000 sf	7.5	2,737.5	2,500,000 sf	7.5	2,737.5
Performance Venue	2.23 lbs/seat	10,000 seats	5.6[b]	836.3[c]	0	0	0	10,000 seats	5.6	836.3[c]
Stadium	2.23 lbs/seat	0	0	0	65,550 seats[d]	73.1	2,339.2[e]	65,550 seats	2,339.2	2,339.2[e]
Artist Studios/Art Center	0.006 lbs/sf	0	0	0	255,000 sf	0.8	292	255,000 sf	0.8	292.0
Community Facilities	0.006 lbs/sf	50,000 sf	0.15	54.8	50,000 sf	0.15	54.8	100,000 sf	0.3	109.6
Total				***13,082***			***8,745***			***21,827***

SOURCE: PBS&J 2009; Generation Factors from Arup, *Carbon Footprint Report*, March 24, 2009.

a. Calculated by adding the horizontal columns, rather than calculating total number of units by the generation rate.
b. The Performance venue is projected to be 50 percent attendance.
c. Assumes 150 events per year at 50 percent attendance.
d. Assumes a sold-out event with a 5 percent "no-show" rate.
e. Assumes 12 sold-out games and 20 other sold-out stadium events per year.

Impact of Candlestick Point

Impact UT-7a **Implementation of the Project at Candlestick Point would not generate solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

Operation of the Candlestick Point development would generate approximately 13,082 tons of solid waste annually when all uses are fully operational and assuming no waste-reduction measures. This would represent approximately 2 percent of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons). Approximately 72 percent of the City's total waste stream, by volume, was diverted in 2008.[1049] Of the wastes that were not diverted, the City estimates that up to 65 percent of the total volume consists of readily recyclable or compostable materials, such as paper and food scraps.[1050] The remainder of the wastes consists of materials such as disposed household items and furniture, hazardous wastes, and construction wastes.

The City has implemented a number of aggressive strategies to divert additional solid waste and achieve citywide diversion goals. The City plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020. The City encourages residents and businesses to pre-sort recyclables, compostable wastes (food scraps and yard waste), and garbage into separate curbside collection containers, sponsors regular public outreach events to educate San Francisco residents and businesses about waste diversion techniques, and conducts special collection events for wastes that are not generally recyclable at curbside (e.g. batteries, electronics, hazardous wastes). For municipal operations, City departments participate in a sustainable purchasing program that encourages the purchase of recyclable materials. The City also sponsors grants for waste diversion research and works with businesses to create market opportunities for materials reuse and recapture. Local waste management providers have upgraded sorting and transfer facilities to maximize the volume of material diverted. On June 9, 2009, the City Board of Supervisors approved an ordinance that requires recycling and composting by residential and commercial uses. All residents and businesses of Candlestick Point would be required to comply with the City's mandatory recycling and composting ordinance. The Project Applicant also proposes to provide recycling facilities for residents and tenants of commercial and retail space, including recycling containers in common areas.

The City's contribution to landfills is anticipated to diminish over time as the City implements more aggressive waste-diversion strategies. Increasing solid waste diversions would extend the life of the landfills utilized by the City, lengthening the time horizon before the remaining disposal capacity is filled.

Consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant shall prepare a Site Waste Management Plan (SWMP) as required by mitigation measure MM UT-7a that will specify the methods by which the Project would divert operational solid waste to assist the City in achieving its diversion goals. The following mitigation measures shall be implemented:

[1049] This figure is a preliminary estimate and represents the most recent data available. California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Available online at: <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco> (accessed November 5, 2008).

[1050] San Francisco, *Waste Characterization Study: Final Report.* 2008.

MM UT-7a *Site Waste Management Plan. The Project Applicant shall prepare a Site Waste Management Plan (SWMP) in cooperation with the Agency to describe the methods by which the Project shall minimize waste generation not otherwise covered by existing City regulatory policies, with the goal of achieving a diversion rate of at least 72 percent, consistent with the City's existing diversion rate in 2008. The SWMP shall be submitted to the Department of Environment (DOE) for approval prior to the issuance of the first development permit for the Project.*

- As noted, above, the Altamont Landfill is scheduled to close in January 2029, prior to full build-out of Candlestick Point, and the City's existing contract with Altamont Landfill expires in 2014, before build-out of Candlestick Point. Three landfills have been identified as candidates to accommodate the City's solid waste needs after the contract with Altamont Landfill expires. The process of selection and negotiation of a new contract is anticipated to be completed by early 2010. As a primary course of business, the City would continue to ensure that solid waste can be disposed of through new contracts or reinstated contracts with solid waste disposal facilities and through aggressive waste-minimization efforts. Further, implementation of mitigation measure MM UT-7a would provide specific strategies to ensure that the Project reduces solid waste disposed of in landfills in a manner consistent with the City's overarching goal of achieving zero waste by 2020. The impact of operational solid waste generated by the Candlestick Point development on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Impact of Hunters Point Shipyard Phase II

Impact UT-7b **Implementation of the Project at HPS Phase II would not generate solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

Operation of the HPS Phase II development would generate approximately 8,745 tons of solid waste annually when all uses are fully operational and assuming no waste reduction measures. This would represent approximately 1.4 percent of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons). As discussed in more detail in Impact UT-7a, the City has implemented a number of aggressive strategies to divert additional solid waste and achieve citywide diversion goals. The City plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020. In 2008, the City achieved 72 percent landfill diversion.

All residents and businesses of the HPS Phase II would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant will prepare a Site Waste Management Plan as required by mitigation measure MM UT-7a that would specify the methods by which the Project would divert operational solid waste to assist the City in achieving its diversion goals.

As noted, above, the Altamont Landfill is scheduled to close in January 2029, after full build-out of HPS Phase II, and the City's existing contract with Altamont Landfill expires in 2014, before build-out of the HPS Phase II. Three landfills have been identified as candidates to accommodate the City's solid waste needs after the contract with Altamont Landfill expires. The process of selection and negotiation of a new contract is anticipated to be completed by early 2010. As a primary course of business, the City would continue to ensure that solid waste can be disposed of through new contracts or reinstated contracts with

solid waste disposal facilities and through aggressive waste minimization efforts. Further, implementation of mitigation measure MM UT-7a would provide specific strategies to ensure that the Project reduces solid waste disposed of in landfills in a manner consistent with the City's overarching goal of achieving zero waste by 2020. The impact of operational solid waste generated by the HPS Phase II on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Combined Impact of Candlestick Point and Hunters Point Shipyard Phase II

Impact UT-7 **Implementation of the Project would not generate solid waste that would exceed the capacity of landfills serving the City and County of San Francisco. (Less than Significant with Mitigation)** ***[Criterion Q.f]***

At full build-out, the Project would generate approximately 21,827.1 tons annually when all uses are fully operational and assuming no waste reduction measures. This would represent approximately 3.7 percent of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons). As discussed in more detail in Impact UT-7a, the City has implemented a number of aggressive strategies to divert additional solid waste and achieve citywide diversion goals. The City plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020. In 2008, the City achieved 72 percent landfill diversion.

All residents and businesses of the Project would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant will prepare a Site Waste Management Plan as required by mitigation measure MM UT-7a.1 that would specify the methods by which the Project would divert operational solid waste to assist the City in achieving its diversion goals.

- The Altamont Landfill is scheduled to close in January 2029, prior to full build-out of the Project, and the City's existing contract with Altamont Landfill expires in 2014, before build-out of the Project. Three landfills have been identified as candidates to accommodate the City's solid waste needs after the contract with Altamont Landfill expires. The process of selection and negotiation of a new contract is anticipated to be completed by early 2010. As a primary course of business, the City would continue to ensure that solid waste can be disposed of through new contracts or reinstated contracts with solid waste disposal facilities and through aggressive waste minimization efforts. Further, implementation of mitigation measure MM UT-7a would provide specific strategies to ensure that the Project reduces solid waste disposed of in landfills in a manner consistent with the City's overarching goal of achieving zero waste by 2020. The impact of operational solid waste generated by the HPS Phase II on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Impact UT-8: Hazardous Waste Generation

The Project Description identifies proposed land uses, but the specific businesses or activities that could operate in the Project are not known at this time. The analysis assumes nearly all Project uses would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical

at this stage of Project development. It is assumed that a variety of hazardous materials could be used, ranging from R&D, in which a wide variety of hazardous materials would be used, facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios. In addition, remediation activities undertaken as part of the Project (addressed in Section III.K), could generate hazardous substances for disposal. For purposes of the analysis, compliance with existing federal, state, and local laws and regulations pertaining to disposal of hazardous materials would be assumed.

Impact of Candlestick Point

Impact UT-8a **Implementation of the Project at Candlestick Point would not generate hazardous waste that would exceed the permitted capacity of transport, storage, and disposal facilities authorized to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

As noted, the specific businesses or activities that could operate at Candlestick Point are not known at this time. Nearly all Project uses would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this stage of Project development. Hazardous wastes are considered to include waste that is toxic, reactive, ignitable, or corrosive.[1051] The uses at Candlestick Point would consist primarily of office, hotel, residential, and retail, which would not generate significant amounts of hazardous waste. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes (refer to Setting). Since no heavy industrial or hospital uses (other than potentially medical or veterinary offices, which would generate hazardous wastes in small quantities) are proposed under the Project, the amount of hazardous wastes that would be generated would be minimal, consisting primarily of household hazardous waste, such as batteries, cleaning products, universal waste (appliances, cellular phones), and small amounts of inorganic wastes such as waste oil from commercial uses. Emptied household hazardous materials and pesticide containers with a capacity of five gallons or less and aerosol containers that are emptied to the maximum extent practical under normal use are exempt from regulation by the EPA.[1052] New residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Because the minimal amount of hazardous waste that would be generated by the Project could be accommodated by existing facilities, this impact would be less than significant, and no mitigation is required.

Impact of Hunters Point Shipyard Phase II

Impact UT-8b **Implementation of the Project at HPS Phase II would not generate hazardous waste that would exceed the permitted capacity of transport, storage, and disposal facilities authorized to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

As noted, the specific businesses or activities that could operate at HPS Phase II are not known at this time. Nearly all Project uses would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated

[1051] USEPA, 2009.
[1052] USEPA, 2009.

with new proposed uses is not practical at this stage of Project development. Therefore, it is assumed that a variety of hazardous materials could be used, ranging from R&D in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios. The uses proposed at HPS Phase II would not include Large-Quantity Generators (more than 600 pounds of hazardous waste generation per month). It is not likely that the Project would include Small Quantity Generators (SQG) as defined by the USEPA, which generate more than 60 pounds, but less than 600 pounds, of hazardous waste per month. The amounts of hazardous waste that would be generated by uses at HPS Phase II would not be substantial.

Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes (refer to Setting). Since no industrial uses are proposed under the Project, the amount of hazardous wastes that would be generated would be minimal, consisting primarily of household hazardous waste, such as batteries, cleaning products, universal waste (appliances, cellular phones), and small amounts of inorganic wastes such as waste oil from commercial uses. New residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Because the minimal amount of hazardous waste that would be generated by the Project could be accommodated by existing facilities, this impact would be less than significant, and no mitigation is required.

Combined Impact of Candlestick Point and Hunters Point Shipyard Phase II

Impact UT-8 **Implementation of the Project would not generate hazardous waste that would exceed the permitted capacity of transport, storage, and disposal facilities authorized to treat such waste. (Less than Significant)** ***[Criterion Q.f]***

As noted, the specific businesses or activities that could operate under the Project are not known at this time. Nearly all Project uses would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this stage of Project development. Therefore, it is assumed that a variety of hazardous materials could be used in small quantities, ranging from R&D in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios, and the marina, where small quantities of fuel could be utilized. The uses proposed would not include Large-Quantity Generators (more than 600 pounds of hazardous waste generation per month). It is not likely that the Project would include Small Quantity Generators (SQG) as defined by the USEPA, which generate more than 60 pounds, but less than 600 pounds, of hazardous waste per month. The amounts of hazardous waste that would be generated by uses at the Project would not be substantial.

Since there is no established ceiling on capacities of TSDs in California and adjoining states, it is assumed there would be sufficient capacity to accommodate all anticipated hazardous wastes (refer to Setting). Since no industrial uses are proposed under the Project, the amount of hazardous wastes that would be generated would be minimal, consisting primarily of household hazardous waste and small amounts of inorganic wastes such as waste oil from commercial uses. New residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Because the

minimal amount of hazardous waste that would be generated by the Project could be accommodated by existing facilities, this impact would be less than significant, and no mitigation is required.

Impact UT-9: Compliance with Solid Waste Regulations

Impact UT-9 **Implementation of the Project would comply with federal, state, and local statutes and regulations related to solid waste. (Less than Significant with Mitigation)** ***[Criterion Q.g]***

The City currently has a solid waste diversion rate of approximately 72 percent, which exceeds the 50 percent diversion threshold specified in the California Integrated Waste Management Act. By 2010, the City must achieve a 75 percent diversion rate to meet internal citywide goals and to comply with the conditions of an agreement between the City and the Altamont Landfill. The City anticipates that it would achieve a total waste diversion rate of at least 75 percent by 2010 through continued implementation of the City's Zero Waste strategies and recent improvements to the efficiency of sorting and transfer facilities. Development within the Project site would meet or exceed all of the City's solid waste diversion requirements for new development. Mitigation measure MM UT-7a.1 requires the Project Applicant to provide a Site Waste Management Plan demonstrating the manner in which the Project would comply with these requirements. The Project Applicant proposes to provide recycling facilities for residents and tenants of commercial and retail space. Implementation of mitigation measures MM UT-7a.1, MM UT-7a.2, and MM UT-5a would ensure compliance with applicable regulations pertaining to solid waste. Development of the Project would not conflict with regulatory policies pertaining to solid waste and this impact would be less than significant.

Cumulative Impacts

The geographic context for an analysis of cumulative impacts associated with solid waste is the City of San Francisco. The past and present development in the City is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process.

Development of the Project would comply with federal, state, and local statutes and regulations. All cumulative development in the City would be expected to meet or exceed all solid waste diversion requirements for new development. Therefore, there would be no cumulative problem with respect to this threshold. The Project would comply with all applicable regulations pertaining to solid waste, both from construction and operation, and the cumulative impact would be less than significant.

There is a growing landfill capacity problem for municipal solid waste and construction waste in the State of California, and various approaches are being explored and implemented to help reduce the impact of the increasing amounts of solid waste generated by a growing population. Even with implementation of increased recycling programs, the future capacity of landfills to accommodate the State's solid waste is uncertain. There could be a shortage of landfill space in the future, as some landfills are nearing capacity or would close during the planning period for the General Plan. This is a potentially significant cumulative problem.

In 1988, the City of San Francisco entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste. Through August 1, 2009, the City has used 12,579,318 tons of this capacity. The City projects that the remaining capacity would be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[1053]

The City has issued a Request for Qualifications to solicit bids for a new contract to accommodate the City's disposal capacity beyond the expiry of the current agreement. The City has selected three landfills that have the capacity to meet the City's future needs and is in the final stages of the selection process that will result in an agreement for ratification by the Board of Supervisors no later than early 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs.

Cumulative development in the City would generate varying amounts of solid waste that would decrease the remaining capacity of servicing landfills. The City has implemented a number of aggressive strategies to divert additional solid waste and achieve citywide diversion goals. The City plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020, and its contribution of solid waste to landfills is anticipated to continue to diminish over time. Increasing solid waste diversions would extend the life of the landfills utilized by the City, lengthening the time horizon before the remaining disposal capacity is filled. The Green Building Ordinance, Chapter 7 of the Environment Code, establishes LEED® Silver level as the standard for all City building projects, which can include the goal of diverting 75 percent of construction and demolition debris from landfills for each project. Therefore, contributions from the Project, combined with cumulative projects, which would also be subject to the Green Building Ordinance, would not substantially contribute to landfills. The amount of waste generated by the Project would be a relatively small percentage (3.7 percent) of the solid waste generated by the City, without any recycling efforts beyond a 75 percent diversion rate. The Project Applicant would implement strategies for reduction of construction waste, as identified, above, and would achieve a construction waste diversion rate of at least 75 percent. Implementation of mitigation measure MM UT-7a would provide for preparation of a waste diversion plan that would address waste-diversion strategies for areas not otherwise covered by existing City policies. With compliance with the Green Building Ordinance and implementation of on-site recycling, the Project would not make a cumulatively considerable contribution to any potential cumulative impact with regard to landfill capacity. The Project's cumulative impact would be less than significant.

Development of cumulative projects in the City of San Francisco could result in additional hazardous waste generation, depending on the uses proposed. As there are no capacity issues with regard to transport or treatment of hazardous waste, as noted, above, the cumulative projects would not contribute hazardous waste that would exceed the capacity of the TSDs authorized to handle this waste. Even if there were a significant cumulative problem with regard to hazardous waste, since no heavy industrial or hospital uses are proposed under the Project, the amount of hazardous wastes that would be generated would be minimal, consisting primarily of household hazardous waste and small amounts of inorganic wastes such as waste oil from commercial uses, and the Project would not make a considerable contribution to such cumulative impact. New residents and businesses would be expected to comply with all hazardous waste

[1053] E-mail communication with David Assman, City of San Francisco, Department of the Environment, October 19, 2009.

regulations, including the disposal of household hazardous waste. The Project's cumulative impact with regard to hazardous waste would, therefore, be less than significant.

Electricity, Natural Gas, and Telecommunications

III.Q.11 Setting

Utilities within the Project area are located above and below ground. Above-ground level utilities include overhead electrical distribution and transmission lines. Underground utilities include electrical, gas, TV/cable, fiber optics communications, and telephone. Pacific Gas & Electric (PG&E) currently provides natural gas and electricity services to Candlestick Point and Hunters Point. Project consumption of electricity and natural gas is addressed in Section III.R. The following section discusses utility infrastructure and how the Project would affect distribution of those resources.

The PG&E system is composed of 123,054 circuit miles of electric distribution lines and 18,610 circuit miles of interconnected transmission lines, 40,123 miles of natural gas distribution pipelines and 6,136 miles of transportation pipelines.[1054] PG&E produces or buys its power from a mix of conventional and renewable energy sources. PG&E acquires electricity from over 400 independent producers as well as some out-of-state producers. The electricity is carried over the bulk grid, a network of high-voltage transmission lines that connect power plants to substations. Substations then switch the electricity from the transmission system to the distribution system, transforming the voltage from high to low in the process. The distribution system includes main, or primary, lines, as well as secondary lower-voltage lines, which deliver electricity either overhead or underground, distribution transformers, which lower voltage to usage levels, and switching equipment, which allow the lines to be connected together in various configurations.

PG&E also operates a hydroelectric system built along 16 river basins stretching nearly 500 miles from Redding in the north to Bakersfield in the south. Water used to power the hydroelectric system comes from more than 100 reservoirs located mostly in the higher elevations of California's Sierra Nevada mountain range. The system includes 68 powerhouses that have a total generating capacity of 3,896 megawatts. PG&E also owns the Diablo Canyon Power Plant, located in San Luis Obispo County, California.

The Project area currently has a 12kV electrical connection to the PG&E grid. Such a connection is capable of supporting an operating load of approximately 9MW.

Natural gas is currently provided to the Project site by PG&E. PG&E's natural gas piping system delivers natural gas from three major sources: California, Southwestern US, and Canada. Natural gas from underground wells is cleaned and treated, removing sand, dust, and water, and compressed for storage in underground storage fields. A compressor station increases gas pressure to move it into storage or through transmission lines. High-pressure transmission lines transport the natural gas to the distribution system via a network of mostly underground lines. Regulators reduce the pressure of the gas entering the distribution system, which consists of both high- and low-pressure mains that distribute gas from the regulator station. The Project's on-site infrastructure would connect to the existing infrastructure at Crisp and Griffith, Innes and Donahue, and at Harney Way.

[1054] PG&E, 2009.

Telephone, television, and internet services could be provided by any one of a number of service providers in the City of San Francisco.

III.Q.12 Regulatory Framework

Federal

There are no federal policies pertaining to electricity, natural gas, or telecommunications.

State

The California Public Utilities Commission regulates investor-owned electric and natural gas utilities operating in California, including PG&E. There are no State policies pertaining to electricity, natural gas, or telecommunications.

Local

Section 1636 of the City of San Francisco Subdivision Code requires that the subdivider provide electric, gas and communication services connected to the appropriate public utility's distribution system. Improvement plans, including an infrastructure plan, must be submitted to the City for approval following approval of the Tentative Map and prior to filing the Final Map. The Project Applicant would be required to obtain approval of the improvement plans pursuant to Article 31, Section 3100 of the San Francisco Health Code, which governs development at Hunters Point Shipyard.

III.Q.13 Impacts

Significance Criteria

The CCSF and Agency have not formally adopted significance standards for impacts related to dry utilities, but generally consider that implementation of the Project would have significant impacts on these resources if it were to:

Q.h Require or result in the construction of new or expansion of existing utility infrastructure, the construction of which could cause significant environmental effects

Q.i Result in a determination by the utility service provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments

Analytic Method

The existing dry utility (electricity, natural gas, and telecommunications/cable) infrastructure is described, and any required extensions of this infrastructure to accommodate the Project are identified. Project requirements are then compared against the capacity of the service providers to accommodate Project needs.

Construction Impacts

Significance criterion Q.h, above, indicates that the Project would have a significant adverse effect if it would require or result in the construction of new facilities or expansion of existing utility infrastructure, the construction of which could cause significant environmental effects. The proposed improvements within the HPS Phase II and Candlestick Point boundaries include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. In addition, the joint trench will include conduits and conductors for street lighting and traffic signals. The power supplier may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into the HPS Phase 2 project site. This could include a new substation within the project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the Project.

Operational Impacts

Impact UT-10: Utility Service Capacity

Impact UT-10 **Implementation of the Project would not require extension of dry utility infrastructure that would exceed the capacity of the services providing such utilities. (Less than Significant)** ***[Criterion Q.i]***

The Project site is currently served by the PG&E electrical distribution system. The Project has not yet selected a service provider for electricity, which would be either PG&E or SFPUC. The Project would provide a joint trench network for the Candlestick Point and HPS Phase II developments that would include electrical, communications, and gas utilities. In addition, the joint trench would include conduits and conductors for street lighting and traffic signals. Major and minor joint trenches would be routed through the street network to provide power, communications, and gas facilities to the development areas.

The projected electricity load for the fully developed Project is estimated to be approximately 44 MW by the year 2021. This value includes the load assumption for the stadium and includes a number of energy-efficiency and low-energy design measures.[1055] The Project would require an upgrade of the existing connection to the grid. The electricity provider may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into the Project site and improvements could include a new substation within HPS Phase II. Although the Project would result in an increase in electricity demand in the City, it would comply with the energy-conservation standards specified in Title 24 of the CCR and, in fact, would achieve a 15 percent improvement over Title 24 requirements. Further, implementation and extension of utility infrastructure would be fully funded and constructed by the Project Applicant. As part of its Infrastructure Plan, the Project Applicant would identify and implement all needed upgrades to the distribution system, including installation of new transformers, additional distribution lines, switches, and/or potentially an electrical substation, as noted. The Infrastructure Plan would also be subject to the approval of the City to ensure that adequate capacity is provided to accommodate the Project. As required

[1055] Arup, March 2009.

by law, all utility connections would be constructed in accordance with the Uniform Building Code, City Ordinances, and Department of Public Works standards to ensure an adequately sized and properly constructed electrical transmission and conveyance system.

Similarly, the on-site natural gas distribution system would connect to the existing PG&E system at Crisp and Griffith, Innes and Donahue, and at Harney Way. All natural gas connections would be constructed in accordance with the Uniform Building Code, City Ordinances, and Department of Public Works standards to ensure an adequately sized and properly constructed natural gas transmission and conveyance system. Further, implementation and extension of utility infrastructure would be fully funded and constructed by the Project Applicant. The Infrastructure Plan would contain a comprehensive description of all natural gas distribution upgrades required by the Project, as well as the specific locations of all connections. The Plan would be subject to the approval of the City prior to the issuance of development permits.

Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Telecommunications and cable services would be provided for the Project by any one of a number of providers in the San Francisco area. The service providers would provide any needed upgrades to their distribution systems, including new switching and routing equipment, to accommodate the demand of the Project. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR.

The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant. No mitigation is required.

Cumulative Impacts

The geographic context for an analysis of cumulative impacts associated with dry utilities would be the service areas of the respective providers. For electricity, it would be either the service area of PG&E or the SFPUC. For natural gas, the context would be the service area of PG&E. Telecommunications and cable have varying service areas depending on the provider. Telecommunications providers are "on-demand" services, providing additional infrastructure as demand grows. These service providers would extend their infrastructure to accommodate growth within their service areas. The past and present development in these service areas is generally described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. The service area of PG&E, however, extends beyond the City and County of San Francisco; PG&E provides natural gas and electric service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California. Its service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process.

Development of cumulative projects, in combination with the Project, would increase demand for electricity, natural gas, and telecommunications services. All cumulative projects within the City of San Francisco would be required to comply with the subdivision code and other applicable City codes, which, among other provisions, require that infrastructure plans be submitted for approval to demonstrate that adequate infrastructure exists or would be constructed to accommodate the project. Other jurisdictions in the providers' service areas have similar requirements, particularly for larger projects, to ensure that project needs can be accommodated by various public services. Since California's energy crisis in 2001, utility planning is done in a much more coordinated manner to achieve adequacy of supply, to establish and oversee formal operational standards for running the bulk power systems, and to address security concerns for critical electrical infrastructures.[1056] This coordination is administered under mandatory procedures set up by the electric power industry's electricity reliability organization (the North American Electric Reliability Corporation), with oversight provided by the Federal Energy Regulatory Commission and the US Department of Energy.[1057] This planning effort has resulted in a more dependable electricity supply to the state, and new transmission lines are being built throughout California and elsewhere to ensure a steady and reliable supply of electricity. In addition, all projects in California are subject to Title 24 requirements for energy conservation. New energy-conservation measures recommended by the Attorney General and CAPCOA (refer to Section III.S), further reducing energy consumption. Therefore, development of cumulative projects is not anticipated to result in demand exceeding supply, and there would be no significant cumulative impact. The Project's infrastructure improvements would ensure that necessary upgrades to the electrical distribution system are provided and that capacity of the service provider to provide electricity to the Project and existing customers would not be exceeded. The Project's cumulative impact would be less than significant.

With regard to natural gas, substantial expansion projects have been completed around the country in the last few years. For example, during 2008, at least 84 natural gas pipeline projects were completed, adding close to 4,000 miles of natural gas pipeline and about 43.9 billion cubic feet per day of new capacity to the national natural gas pipeline grid.[1058] New exploration and drilling projects are also underway. These efforts will help accommodate the country's needs for natural gas. PG&E similarly develops new sources of natural gas to serve its customers. All projects in California are subject to Title 24 requirements for energy conservation. Therefore, development of cumulative projects is not anticipated to result in demand exceeding natural gas supply, and there would be no significant cumulative impact. The Project's infrastructure improvements would ensure that necessary upgrades to the natural gas distribution are provided and that capacity of PG&E to provide natural gas to the Project and its existing customers would not be exceeded. The Project's cumulative impact would be less than significant.

Telecommunications services are provided on demand, and service providers expand their distribution systems as needed to accommodate growth. Cumulative projects would increase demand for these services, but would be accommodated by any one of a number of providers in the San Francisco area. Therefore, there would be no significant cumulative impact. The Project's telecommunications needs would be accommodated by these providers, and demand would not exceed supply. Therefore, the Project's cumulative impact would be less than significant.

[1056] California Department of Energy, 2009.
[1057] Energy Information Administration, http://www.eia.doe.gov/ Accessed 10/27/09.
[1058] Energy Information Administration, http://www.eia.doe.gov/ Accessed 10/27/09.

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SECTION III.R ENERGY

III.R.1 Introduction

This section assesses the significance of the use of energy, including electricity, natural gas and gasoline and diesel fuels, by the Project activities. It discusses existing energy use patterns at the Project site and examines whether Project activities would result in the consumption of large amounts of fuel or energy, or use of such resources in a wasteful manner. A number of factors are considered when weighing whether a project would use a proportionately large amount of energy or whether the use of energy would be wasteful in comparison to other projects. Factors such as the use of on-site renewable energy features (such as photovoltaics) or energy conservation features or programs are considered. This section analyzes the potential for both Project level and cumulative environmental impacts. The analysis in this section concludes that no potentially significant or significant environmental impacts would result from the Project's energy usage; therefore, no mitigation measures are required.

This section is based upon consumption and infrastructure information from Pacific Gas & Electric (PG&E) and energy use studies from the California Energy Commission (CEC).[1059] The Project's energy use was modeled using factors from the *Climate Change Technical Report for the CP-HPS Development Plan* (included as Appendix S [Climate Change Technical Report]); the California Department of Transportation's *California Motor Vehicle Stock, Travel and Fuel Forecast*;[1060] and land use data from Chapter II (Project Description).[1061]

Refer to Section III.S (Greenhouse Gas Emissions) for a discussion of the relationship between energy consumption and greenhouse gas emissions. Refer to Section III.Q (Utilities) for a discussion of water consumption.

III.R.2 Setting

■ Electricity

Overview

Electricity is a current of energy generated by combustion of fuels, nuclear fission, hydroelectric or wind power, photovoltaics/solar panels, or geothermal technologies. The capacity of electricity infrastructure[1062] is generally discussed in terms of kilowatts (kW), a measure of energy intensity, while total electricity consumption is discussed in terms of kilowatt-hours (kWh), equal to one thousand watts over a one-hour period.

[1059] Individual studies and data sources are cited throughout the Setting.
[1060] California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009.
[1061] Copies of these documents are on file for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor, as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.
[1062] Local electrical capacity is a function of the capacity of the transmission network to convey power to a service area, the capacity of the local substations to "step down" the power to deliverable voltages, and of the adequacy of the local distribution network to deliver power to end users.

On a per capita basis, Californians consume approximately 7,032 kilowatt-hours (kWh) of electricity annually, the lowest statewide per capita consumption in the country.[1063] In comparison, the average annual US per capita consumption is 12,347 kWh.[1064] However, California's overall electricity consumption is second only to that of Texas.[1065] The large statewide demand for electricity creates economic vulnerability, as seen during the Western Energy Crisis of 1996 (a period of energy price fluctuation triggered by deregulation of the energy industry).[1066] Although California has made substantial progress in reducing energy consumption on a per capita basis, total demand for electricity is expected to increase with population and economic growth. The State recognizes that efficiency programs alone cannot address demand and that such programs must be supplemented with programs designed to ensure a stable, reliable energy supply.[1067] State agencies, utility providers, and the general public have invested in renewable energy development as a means of achieving energy stability. Refer to the discussion of renewable energy in the "Renewable and Alternative Energy" section and to Section III.R.3 (Regulatory Framework).

One of the difficulties in managing electricity consumption is that, once generated, electricity cannot be stored. Thus, a utility provider's overall generation capacity must be sized to accommodate peak demand. Load management strategies, which are energy efficiency strategies that focus on minimizing electricity demand during peak demand periods, allow providers to use smaller generation facilities and transmission infrastructure.[1068] Title 24 energy standards, discussed in Section III.R.3, weight consumption during peak periods to emphasize the need for peak hour conservation. Strategies designed to minimize long-term use are also helpful in reducing the need for infrastructure expansions. The Project's strategies to reduce peak loads and reduce overall energy demand are discussed in Section III.R.4 (Impacts).

The City receives approximately 76 percent of its electricity from PG&E.[1069] The remaining electricity is generated by hydroelectric facilities associated with HHWP that operate in the western Sierra Nevada Mountains (16 percent) and by small local generation facilities (8 percent).[1070] Table III.R-1 (Electricity Consumption in San Francisco, by Land Use [2007]) depicts energy demand by land use type in San Francisco. As shown in Table III.R-1, commercial uses account for nearly 60 percent of all electricity consumption, while residential uses account for approximately 28 percent of the usage.[1071] A total of 5,155 million kWh are consumed annually in San Francisco.

[1063] California Energy Commission, *US Per Capita Electricity Use by State in 2005,* website: http://energyalmanac.ca.gov/electricity/us_per_capita_electricity_2005.html, accessed August 17, 2009.
[1064] California Energy Commission, *US Per Capita Electricity Use by State in 2005,* website: http://energyalmanac.ca.gov/electricity/us_per_capita_electricity_2005.html, accessed August 17, 2009.
[1065] California Energy Commission, *US Per Capita Electricity Use by State in 2005,* website: http://energyalmanac.ca.gov/electricity/us_per_capita_electricity_2005.html, accessed August 17, 2009.
[1066] Federal Energy Regulatory Commission, *The Western Energy Crisis, the Enron Bankruptcy, and FERC's Response,* website: http://www.ferc.gov/industries/electric/indus-act/wec/chron/chronology.pdf, accessed August 27, 2009.
[1067] California Energy Commission, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF.
[1068] California Energy Commission, *Load Management Standards Proceeding,* website: http://www.energy.ca.gov/load_management/, accessed August 20, 2009.
[1069] City and County of San Francisco, *Environment Code,* Chapter 18: Solar Energy Incentive Program, accessed August 20, 2009.
[1070] City and County of San Francisco, *Environment Code,* Chapter 18: Solar Energy Incentive Program, accessed August 20, 2009.
[1071] Rocky Mountain Institute, *An Energy Resource Investment Strategy for the City and County of San Francisco,* website: http://sfwater.org/detail.cfm/MC_ID/12/MSC_ID/138/MTO_ID/239/C_ID/1346, accessed August 20, 2009.

Table III.R-1 Electricity Consumption in San Francisco, by Land Use (2007)		
Land Use	*Total Consumption (million kWh)*	*Percent of Total Consumption*
Commercial	3,087.59	60%
Residential	1,454.81	28%
Industrial	76.60	1%
Construction	35.61	1%
Water Supply	302.85	6%
Other	197.39	4%
Total	***5,154.85***	***100%***

SOURCE: California Energy Commission, *County Electricity Deliveries by NAICS: San Francisco County*. http://ecdms.energy.ca.gov/utilbynaicselec.asp (accessed August 27, 2007).

Project Site Demand

Existing electricity use at the Project site was estimated by applying electricity use factors from the Climate Change Technical Report (Appendix S) to existing land uses floor areas and unit totals. Table III.R-2 (Existing Project Site Electricity Demand) shows existing electricity demand at Candlestick Point and HPS Phase II. A total of 9,468 MWh of electricity was consumed at the Project site in 2008. Of this total, approximately 6,026 MWh (64 percent) was consumed at Candlestick Point, and approximately 3,442 MWh (36 percent) was consumed at HPS Phase II.

Table III.R-2 Existing Project Site Electricity Demand							
		Candlestick Point		*HPS Phase II*		*Project Site Total*	
Type of Use	*Energy Use Factor (MWh/gsf or unit)*[a,b,c]	*Existing Development*[d]	*MWh Consumed Annually*[e]	*Existing Development*[d]	*MWh Consumed Annually*[e]	*Existing Development*	*MWh Consumed Annually*
Residential Units	3.617	256 units	926	—	—	256 units	926
Artist Studios	0.0153	—	—	225,000 gsf	3,442	225,000 gsf	3,442
Stadium	N/A	—	5,100	—	—	—	5,100
Total			***6,026***		***3,442***		***9,468***

SOURCES:

Existing electricity demand was estimated based on minimal compliance with 2005 Title 24 standards. Because existing development at the Project site predates adoption of the Title 24 standards, existing consumption may be somewhat higher than reported. Energy consumption is reported for uses that were operational as of September, 2009.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor is in the "Electricity Delivered, Total" column and the "Minimally Title 24 Compliant (2005)" row. The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. The energy use factor cited for the artist studios is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factor is in the Hunters Point Shipyard sub-table in the "Total Energy Intensity" column and the "Community Space and Artist Studio" row. The factor was converted from kWh to MWh.

c. Energy use for the Candlestick Park stadium was estimated in: City and County of San Francisco, 2004. *Climate Action Plan*, Table 2-4.

d. Based on buildout floor areas provided in Table II-2 (Existing and Proposed Uses) of this EIR.

e. Calculated by multiplying energy use factor by number of units or gsf. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

Natural Gas

Overview

Natural gas is a liquid or gaseous fuel composed primarily of methane from decomposed plant and animal material. It can take many different forms depending on the source of extraction and the means by which it is processed following extraction. Natural gas is commonly associated with fossil fuel reservoirs, such as coal beds and petroleum reservoirs, but it is also biogenically produced in wetlands and marshes. Decomposition of wastes in landfills produces methane emissions that can be used as a fuel similar to natural gas.

Because of its low molecular density, natural gas is difficult to store and transport over long distances. Currently, PG&E imports its natural gas from Canada through PG&E-owned transmission pipelines. The state's natural gas supply may be supplemented when necessary from the Rocky Mountains, Texas, and New Mexico, as well as in-state production. Sources of natural gas available to California consumers are expected to decrease over time, even as population increases.[1072] However, natural gas is in high-demand as a fuel for electricity generation because it releases fewer emissions per unit of energy than oil or coal-based fuels. Over half of the natural gas consumed in California annually goes towards the production of electricity.[1073] California's reliance on imported natural gas supplies leaves the state vulnerable to price fluctuations and supply disruptions.[1074]

At 60,000 cubic feet per year (approximately 62 million British thermal units [Btu]),[1075] California's per capita natural gas consumption is lower than the national per capita average of 67,900 cubic feet per year (70 million Btu).[1076] However, in terms of total statewide natural gas consumption, California is second only to Texas. As with electricity, California's high statewide natural gas consumption results from the state's large population and its vigorous economy. While California's successful efficiency programs and its reliance on renewable sources of electricity are expected to slow the demand for natural gas relative to the demand in other parts of the nation, competition for a limited natural gas supply is increasing with corresponding increases in population and economic activity.[1077]

Like electricity, natural gas in San Francisco is supplied by PG&E. As shown in Table III.R-3 (Natural Gas Consumption in San Francisco, by Land Use [2007]), it is consumed largely by residential uses (54 percent) and commercial uses (34 percent).[1078] A total of approximately 28,918,000 million Btu is consumed annually in the City.

[1072] California Energy Commission, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF.
[1073] California Energy Commission, *California Natural Gas Data and Statistics,* website: http://www.energyalmanac.ca.gov/naturalgas/index.html, accessed August 20, 2009.
[1074] California Energy Commission, *California Natural Gas Data and Statistics,* website: http://www.energyalmanac.ca.gov/naturalgas/index.html, accessed August 20, 2009.
[1075] 1 Cubic Foot = 1,028 Btu.
[1076] Based on 2005 data, the most current information published by the California Energy Commission as of the date of publication of this EIR.
[1077] California Energy Commission, *Overview of Natural Gas in California: Natural Gas Costs and Prices*, website: http://www.energyalmanac.ca.gov/naturalgas/overview.html, accessed August 27, 2007.
[1078] California Energy Commission, *County Gas Deliveries by NAICS: San Francisco County,* website: http://ecdms.energy.ca.gov/utilbynaicsgas.asp, accessed August 27, 2007.

Table III.R-3 Natural Gas Consumption in San Francisco, by Land Use (2007)

Land Use	*Total Consumption (million British thermal units [Btu])*	*Percent of Total Consumption*
Residential	15,504,000	54%
Commercial	9,971,000	34%
Industrial	357,000	1%
Construction	182,000	1%
Water Supply	6,000	0%
Other	2,898,000	10%
Total	***28,918,000***	***100%***

SOURCE: California Energy Commission, *County Gas Deliveries by NAICS: San Francisco County*, converted from therms to Btu (1 therm = 100,000 Btu). http://ecdms.energy.ca.gov/utilbynaicsgas.asp (accessed August 27, 2007).

Project Site Demand

Existing natural gas use at the Project site was estimated by applying natural gas use factors from the Climate Change Technical Report (Appendix S) to existing land uses floor areas and unit totals. As shown in Table III.R-4 (Existing Project Site Natural Gas Demand), an estimated total of 14,253 million British thermal units (MBtu)[1079] of natural gas was consumed at the Project site in 2008. Of this total, approximately 9,010 MBtu (63 percent) was consumed at Candlestick Point, with the remaining 5,243 MBtu (37 percent) consumed at HPS Phase II.

Table III.R-4 Existing Project Site Natural Gas Demand

		Candlestick Point		*HPS Phase II*		*Project Site Total*	
Type of Use	*Energy Use Factor (MBtu/gsf or unit)*[a,b,c]	*Existing Development*[d]	*MBtu Consumed Annually*[e]	*Existing Development*[d]	*MBtu Consumed Annually*[e]	*Existing Development*	*MBtu Consumed Annually*
Residential Units	0.0400	256 units	10	—	—	256 units	10
Artist Studios	0.0233	—	—	225,000 gsf	5,243	225,000 gsf	5,243
Stadium	N/A	—	9,000	—	—	—	9,000
Total			***9,010***		***5,243***		***14,253***

SOURCE:

Existing natural gas demand was estimated based on minimal compliance with 2005 Title 24 standards. Because existing development at the Project site predates adoption of the Title 24 standards, existing consumption may be somewhat higher than reported. Energy consumption is reported for uses that were operational as of September, 2009.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor is in the "Electricity Delivered, Total" column and the "Minimally Title 24 Compliant (2005)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

b. The energy use factor cited for the artist studios is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factor is in the Hunters Point Shipyard sub-table in the "Total Energy Intensity" column and the "Community Space and Artist Studio" row. The factor was converted from kBtu to MBtu.

c. Energy use for the Candlestick Park stadium was estimated in: City and County of San Francisco, 2004. *Climate Action Plan,* Table 2-4.

d. Based on buildout floor areas provided in Table II-2 (Existing and Proposed Uses) of this EIR.

e. Calculated by multiplying energy use factor by number of units or gsf. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

[1079] One Btu is approximately the amount of energy needed to heat one pound of water one degree Fahrenheit.

Gasoline and Diesel

Overview

Gasoline and diesel, both derived from petroleum (also known as crude oil), are the two most common fuels used for vehicular travel. According to the CEC, the State relies on petroleum-based fuels for 96 percent of its transportation needs.[1080] In 2006, Californians consumed an estimated 20 billion gallons of gasoline and diesel fuel for transportation, an increase of nearly 50 percent over the last 20 years.[1081]

Although California refines much of its oil reserves in the State (approximately 39 percent), much of the petroleum consumed is produced out of state (approximately 20) or is supplied by foreign sources (41 percent).[1082] California experienced a 23 percent decrease in production between 1996 and 2006 as a result of several factors, including declining fuel reserves and economic and regulatory factors.[1083] Because California is one of the top oil-producing states in the country, the State has been historically able to meet a large portion of its internal demand for petroleum resources through in-state sources. However, as with other energy resources, total demand for energy resources is predicted to rise over the coming decades as production capacity and extraction volume simultaneously decrease. In addition, unlike electricity and natural gas fuels, per capita consumption of petroleum products continues to rise in the Bay Area in spite of conservation programs.[1084]

The declining supply of in-state petroleum products, coupled with increasing demand, has resulted in an increased need for imported oil resources. According to the CEC, California's reliance on crude oil imports will increase from 405 million barrels in 2005 to between 585 million (low forecast) and 685 million (high forecast) barrels in 2025.

Approximately 158 million gallons of gasoline and 11 million gallons of diesel were consumed in San Francisco for transportation in 2007.[1085] By 2030, consumption of transportation-related fossil fuels is expected to increase by about 57 percent citywide.

Project Site Demand

According the *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*,[1086] the current annual vehicle miles traveled (VMT) to and from the Project site is about 58.7 million miles. As shown in Table III.R-5 (Existing Project Site Petroleum Demand), based on existing trip generation and

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[1080] California Energy Commission, *The Role of a Low Carbon Fuel Standard in Reducing Greenhouse Gas Emissions and Protecting Our Economy,* website: http://gov.ca.gov/index.php?/fact-sheet/5155/, accessed August 20, 2009.
[1081] California Energy Commission, Fuels and Transportation Division, website: http://www.energy.ca.gov/transportation/index.html, accessed August 20, 2009.
[1082] "Production" generally refers to the petroleum mining and extraction process, while "refinement" refers to the post-extraction processing necessary to purify petroleum fuels into a usable form. California Energy Commission, Fuels and Transportation Division, website: http://www.energy.ca.gov/transportation/index.html (accessed August 20, 2009).
[1083] California Energy Commission, California Crude Oil Production and Imports http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.pdf.
[1084] California Energy Commission, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF.
[1085] California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009.
[1086] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study,* 2009.

fuel efficiency data, the existing uses at the Project site result in a current demand for approximately 2.70 million gallons of gasoline and 0.17 million gallons diesel fuels per year.

Table III.R-5 Existing Project Site Petroleum Demand

	Existing Annual VMT (million miles travelled)	*Average Countywide Vehicle Fuel Efficiency (2008)*	*Existing Total Fuel Consumption (million gallons)*	*Existing Gasoline Consumption (million gallons)*	*Existing Diesel Consumption (million gallons)*
Candlestick Point	58.7	20.41	2.87	2.70	0.17
Hunters Point Shipyard	0	20.41	0	0	0
Total	***58.7***		***2.87***	***2.70***	***0.17***

SOURCES:

a. Equals the estimated VMT (3,495 million miles travelled) divided by the estimated total transportation fuel consumed (171.27 million gallons) for San Francisco County, as reported in: California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009

b. Annual VMT was calculated by PBS&J based on trip generation information and average trip lengths reported in: CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study,* 2009.

c. On average 94 percent of the transportation fuels consumed in San Francisco were gasoline fuels, while 6 percent were diesel fuels, as reported in: California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009.

d. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

Renewable and Alternative Energy

Renewable Electricity

Renewable electricity generation methods provide a number of benefits. Such methods reduce the State's dependence on the use of imported fossil fuels (including natural gas), reduce the State's vulnerability to price fluctuations in energy markets, and serve to minimize greenhouse gas emissions (refer to Section III.S). The CEC currently defines solar, geothermal, wind, biomass, and small-scale hydroelectric generation methods as renewable electricity sources.[1087,1088] Compared to other utility providers in the State, PG&E's overall electricity generation portfolio contains a relatively high percentage of renewable sources. In 2007, PG&E generated 12 percent of its total electricity through renewable sources, including biomass, small hydroelectric, geothermal, and wind. The remainder of PG&E's generation portfolio includes natural gas combustion (47 percent), nuclear fission (23 percent), large-scale hydroelectric (13 percent), coal combustion (4 percent), and other sources (1 percent).[1089] Although development of renewable energy sources is generally beyond the scope of local development planning, individual development projects may include small-scale generation features, such as photovoltaics, that can be connected to, and supply supplementary electricity to, the primary power grid. In addition, the electricity rates paid by San Francisco consumers support development of future renewable sources, as mandated by state law.

[1087] California Energy Commission, *California's Renewable Energy Programs,* website: http://www.energy.ca.gov/renewables/index.html, accessed August 19, 2009.

[1088] The California Energy Commission considers "renewable" electricity to be electricity produced through use of a rapidly renewable resource, such as sunlight, wind, geothermal energy, etc. In addition, generation of renewable electricity does not result in substantial environmental impacts, such as the production of harmful wastes or harm to sensitive species.

[1089] California Energy Commission, *Sources of Electricity for Major Utilities in California,* website: http://www.pgecorp.com/corp_responsibility/reports/2007/environment/energy-future.html, accessed August 19, 2009.

Currently, there is no renewable electricity generation infrastructure on the Project site.

Alternative Transportation Fuels, Technologies, and Strategies

Commercially available alternative transportation fuels include biodiesel, ethanol, hydrogen, methanol, natural gas, and electricity.[1090] Some of these fuels, such as natural gas, are cleaner-burning petroleum-based alternatives to gasoline and diesel. Other products, such as ethanol and biodiesel, are non-petroleum fuels. Although some alternative fuels can be used in a traditional combustion motor, other alternatives, such as electricity, are based on alternative propulsion technologies. The California Air Resources Board is investigating a number of low-carbon fuel strategies.

Although alternative transportation fuels and technologies could potentially minimize the use of petroleum products, land use planning strategies that result in denser, more compact development are also needed to reduce the need for vehicular travel. Refer to Section III.S and Section III.B (Land Use and Plans) for a description of adopted land use policies promoting such forms of development.

The joint trench systems for the Candlestick Point and Hunters Point Shipyard Phase II development plans would include electrical, communications and gas utilities. A joint trench network would be developed for each development site. Major and minor joint trenches would be routed through the street network to provide power, communications and gas facilities to the development areas.

III.R.3 Regulatory Framework

Federal

Corporate Average Fuel Efficiency Standards

In response to the *Massachusetts et al. vs. Environmental Protection Agency et al.* ruling, the Bush Administration issued an executive order on May 14, 2007, directing the USEPA and Department of Transportation to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. On December 19, 2007, the Energy Independence and Security Act of 2007 (discussed below) was signed into law, which requires an increased Corporate Average Fuel Economy (CAFE) standard of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020. EISA requires establishment of interim standards (from 2011 to 2020) that will be the "maximum feasible average fuel economy" for each fleet. On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for model years 2011 to 2015 passenger cars and light trucks. NHTSA issued a final rule for model year 2011 on March 23, 2009.[1091]

On May 19, 2009, President Obama announced a national policy for fuel efficiency and emissions standards in the US auto industry. The proposed rulemaking is a collaboration between the DOT and USEPA with the support of the United Auto Workers. The proposed federal standards apply to passenger cars, light-

[1090] US Department of Energy, *Alternative and Advanced Fuels,* website: http://www.afdc.energy.gov/afdc/fuels/index.html, accessed August 20, 2009.
[1091] DOT and USEPA, 2009. *Joint Rulemaking to Establish Vehicle CAFE and GHG Emissions Standards,* http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/

duty trucks, and medium duty passenger vehicles built in model years 2012 through 2016. If finalized, the proposed rule would surpass the 2007 CAFE standards and require an average fuel economy standard of 35.5 mpg in 2016. On May 22, 2009, the DOT and USEPA issued a notice of upcoming joint rulemaking on this issue.[1092] A Draft Environmental Impact Statement has been issued and the comment period for this ends on November 9, 2009. On June 30, 2009, the USEPA granted the waiver for California for its greenhouse gas emission standards for motor vehicles; this is described in more detail below.

Energy Independence and Security Act of 2007

In addition to setting increased CAFE standards for motor vehicles, the EISA includes other provisions:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

State

California Code of Regulations, Title 24

New residential and non-residential buildings in California are required to conform to energy conservation standards specified in Title 24, Part 6 of the *California Code of Regulations* (CCR). Title 24 efficiency standards regulate energy consumed for heating, cooling, ventilation, water heating, and lighting on a per-square-foot basis. Title 24 standards do not regulate plug-in appliances. The standards establish "energy budgets," expressed in terms of energy consumed per year. The energy budget weights energy consumed during peak hours to place emphasis on efficiency during these periods. Title 24 standards are updated on a periodic basis; the 2008 standards were adopted in April 2009 and go into effect in January 2010.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). Part 11 establishes voluntary standards, that would become mandatory in the 2010 edition of the Code, on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.

California Code of Regulations, Title 20

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608), dated December 2006, were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for

[1092] USEPA, 2009. *News Release: President Obama Announces National Fuel Efficiency Policy,* http://yosemite.epa.gov/opa/admpress.nsf/6fa790d452bcd7f58525750100565efa/451902cb77d4add5852575bb006d3f9b!OpenDocument.

both federally-regulated appliances and non-federally regulated appliances. While these regulations are now often seen as "business as usual," they do exceed the standards imposed by any other state and reduce GHG emissions by reducing energy demand.

Senate Bill 1078

Senate Bill (SB) 1078, adopted by the State Legislature in September 2002, establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward in 2006 by SB 107 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year.

Senate Bill 1368

Senate Bill (SB) 1368 prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out-of-state as well as in-state, and to publicly owned as well as investor-owned electric utilities.

Senate Bill 1389

Senate Bill (SB) 1389, the *California Integrated Energy Policy*, was adopted by the State Legislature in August 2002. This bill requires the California Energy Commission (CEC) to prepare an Integrated Energy Policy Report (IEPR) for electricity, natural gas, and transportation fuels. The IEPR contains an analysis of the policies and actions that are necessary to ensure that the state has adequate energy resources—including a range of alternative energy resources—to meet its needs. The IEPR also includes recommendations to reduce energy demand and to improve the state's energy infrastructure.

Assembly Bill 1007

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) required the CEC to prepare a State plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the State Alternatives Fuels Plan in partnership with the California Air Resources Board and in consultation with other State, federal, and local agencies.

The final State Alternatives Fuels Plan, published in December, 2007, would attempt to achieve an 80 percent reduction in greenhouse gas emissions associated with personal transportation, even as California's population increases. Measures proposed that would reduce petroleum fuel use include:

1. Lowering the energy needed for personal transportation by tripling the energy efficiency of on-road vehicles by 2050 through:
   a. Conventional gas, diesel, and flexible fuel vehicles (FFVs) averaging more than 40 miles per gallon (mpg).
   b. Hybrid gas, diesel, and FFVs averaging almost 60 mpg.
   c. All electric and plug-in hybrid electric vehicles (PHEVs) averaging well over 100 mpg (on a greenhouse gas equivalents (GGE) basis) on the electricity cycle.
   d. Fuel cell vehicles (FCVs) averaging over 80 mpg (on a GGE basis).

2. Moderating growth in per capita driving, reducing today's average per capita driving miles by about 5 percent or back to 1990 levels.
3. Changing the energy sources for transportation fuels from the current 96 percent petroleum-based to approximately:
   a. 30 percent from gasoline and diesel from traditional petroleum sources or lower GHG emission fossil fuels such as natural gas.
   b. 30 percent from transportation biofuels.
   c. 40 percent from a mix of electricity and hydrogen.
4. Producing transportation biofuels, electricity, and hydrogen from renewable or very low carbon-emitting technologies that result in, on average, at least 80 percent lower life cycle GHG emissions than conventional fuels.
5. Encouraging more efficient land uses and greater use of mass transit, public transportation, and other means of moving goods and people.

Executive Order S-03-05

Executive Order S-03-05 mandates that California emit 80 percent fewer greenhouse gases in 2050 than it emitted in 1990. Energy efficiency and reduced VMT would play important roles in achieving this aggressive goal.

Executive Orders S-14-08 and S-21-09

Since 2006, California has had a mandate to increase the use of renewable generation to 20 percent of retail electricity sales by 2010 (refer to description of SB 1078 and SB 107, above). In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which raises California's renewable energy goals to 33 percent by 2020. This enhanced target is intended to help California meet statewide greenhouse gas emission reduction targets (refer to Section III.S). This has been reiterated by California Executive Order S-21-09 which charges CARB by July 31, 2010, to establish a regulation consistent with this 33 percent target by 2020. This is a further increase in RPS over SB 1078 and SB 107.

Local

San Francisco General Plan

The Environmental Protection Element[1093] of the General Plan includes a number of energy objectives and policies:

Objective 13 Enhance the energy efficiency of housing in San Francisco.

Policy 13.4 Encourage the use of energy conserving appliances and lighting systems.

Policy 13.5 Emphasize energy conservation in local government housing assistance programs.

[1093] City and County of San Francisco, Planning Department, *Environmental Protection Element of the General Plan,* adopted July 1997, updated in 2004.

Objective 14 Promote effective energy management practices to maintain the economic vitality of commerce and industry.

Policy 14.1 Increase the energy efficiency of existing commercial and industrial buildings through cost-effective energy management measures.

Policy 14.4 Promote commercial office building design appropriate for local climate conditions.

Policy 14.5 Encourage use of integrated energy systems.

Objective 15 Increase the energy efficiency of transportation and encourage land use patterns and methods of transportation which use less energy.

Policy 15.1 Increase the use of transportation alternatives to the automobile.

Objective 16 Promote the use of renewable energy sources.

Policy 16.1 Develop land use policies that will encourage the use of renewable energy sources.

Policy 16.2 Remove obstacles to energy conservation and renewable energy systems in zoning and building codes.

Policy 16.3 Develop information resources to assist in the use of renewable energy.

Policy 18.1 Promote government and private financing partnerships to carry out local energy programs.

The Air Quality Element of the General Plan[1094] includes one objective pertaining to energy use:

Objective 6 Link the positive effects of energy conservation and waste management to emission reductions.

The Housing Element of the General Plan[1095] includes one objective pertaining to energy use:

Policy 11.10 Include energy efficient features in new residential development and encourage weatherization in existing housing to reduce overall housing costs and the long-range cost of maintenance.

San Francisco Building Code, Green Building Ordinance

In August 2008, Mayor Gavin Newsom signed into law San Francisco's Green Building Ordinance (codified as Chapter 13C of the *San Francisco Building Code*) for newly constructed residential and commercial buildings and renovations to existing buildings. The ordinance specifically requires newly constructed commercial buildings over 5,000 gross square feet (gsf), residential buildings over 75 feet in height, and renovations of buildings over 25,000 gsf to be subject to Leadership in Energy and Environmental Design (LEED®)Gold (or an equivalent standard), which makes San Francisco the City

[1094] City and County of San Francisco, Planning Department, *Air Quality Element of the General Plan*, adopted July 1997, updated in 2000.
[1095] City and County of San Francisco, *Housing Element of the General Plan,* adopted 2000, updated in 2004.

with the most stringent green building requirements in the nation.[1096] Table III.R-6 (Summary of San Francisco Green Building Ordinance) illustrates the requirements of the Green Building Ordinance. LEED® is a voluntary, internationally recognized green building certification procedure developed by the US Green Building Council. It reflects that a building or community was designed and built using standards for energy saving, water efficiency, carbon dioxide emissions, improved environmental quality, and general stewardship of resources and sensitivity to their impacts.

Key sections of Chapter 13C pertaining to energy include Section 1304C.2.1.6, which requires enhanced building energy system commissioning for all mid-sized commercial buildings, and Section 1304C.2.1.7, which requires that permit applicants submit documentation to verify renewable on-site energy or purchase of green energy credits (effective January 2012).

Table III.R-6 Summary of San Francisco Green Building Ordinance

	2008	*2009*	*2010*	*2012 and Beyond*
Commercial >5,000 gsf	LEED® Certified Rating[a]	LEED® Silver Rating	Same as for 2009	LEED® Gold Rating
Residential (4 units or less)	GreenPoint Rated: complete checklist	GreenPoint Rated: 25 points	GreenPoint Rated: 50 points	GreenPoint Rated: 75 points
Residential (5+ units less than 75 sf tall)	GreenPoint Rated: complete checklist	GreenPoint Rated: 25 points	GreenPoint Rated: 50 points	GreenPoint Rated: 75 points
Residential (5+units greater than 75 ft tall)	LEED® Certified Rating OR GreenPoint Rated: 50 points	Same as for 2008	LEED® Certified Rating or GreenPoint Rated: 50 points.	Same as for 2010

SOURCE: Chapter 13 of San Francisco Building Code, Ordinance No. 180-08, added Sept 4, 2008

a. The Green Building Ordinance requirements are based on the LEED® for Commercial Interiors v. 2.0 standards from June 2005, LEED® for Core and Shell v. 2.0 standards from July 2006, LEED® for New Construction v. 2.0 standards from July 2007, and GreenPoint Rated v. 2007 standards from March 2007. References to LEED® standards are from the LEED® for New Construction v. 2.0. Equivalent standards may be used in place of the cited standards if the same performance objectives are met.

GoSolarSF

In 2008, the San Francisco Public Utilities Commission (SFPUC) launched the "GoSolarSF" program to San Francisco's businesses and residents, offering incentives in the form of a rebate program that could pay for approximately half the cost of installation of a solar power system, and more to those qualifying as low-income residents.

The Planning Department and Department of Building Inspection have also developed a streamlining process for Solar Photovoltaic Permits and priority permitting mechanisms for projects pursuing LEED® Gold Certification.

[1096] Although in meeting the green building standards project proponents are allowed to choose from a range of possible credit options, the Green Building Ordinance makes certain LEED® credits mandatory requirements. Refer to Section III.L (Hydrology and Water Quality) and Section III.S (Greenhouse Gas Emissions) for further detail regarding implementation of the Green Building Ordinance.

Other Policies

Citywide alternative transportation planning efforts adopted by the City include the *Better Streets Policy*,[1097] designed to improve streetscape policies throughout the City, the Transit Effectiveness Project,[1098] designed to improve transit service, and the *Bicycle Plan*,[1099] designed to increase bicycle accessibility throughout the City. The *Transit First Policy* (Section 16.102 of the *City Charter*) gives priority to public transit investments over other transportation investments; adopts street capacity and parking policies to discourage increased automobile traffic; and encourages the use of transit, bicycling, and walking rather than use of single-occupancy vehicles. San Francisco's 2004 *Climate Action Plan* commits the City to reducing greenhouse gas emissions by 20 percent below 1990 levels by 2012, and outlines actions, including improving energy efficiency that the City can take to meet this goal. Finally, the City's *Planning Code* reflects smart growth policies, such as requiring electric vehicle refueling stations in city parking garages, bicycle storage facilities for commercial and office buildings, and zoning that is supportive of high density mixed-use infill development.

III.R.4 Impacts

Significance Criteria

The City and Agency have not formally adopted significance standards for impacts related to energy, but generally consider that implementation of the Project would have significant impacts if it were to:

R.a Encourage activities that result in the use of large amounts of fuel or energy, or use such resources in a wasteful manner[1100]

Analytic Method

To determine whether the Project would use large amounts of fuel or energy, this analysis provides a quantitative overview of the energy that would be expected to be consumed during the construction and operation of the Project. The analysis also weighs the Project's energy efficiency features when considering the Project's potential for wasteful energy consumption.

Data from the Climate Change Technical Report (Appendix S)[1101] was used to estimate the total energy use per residential unit for space heating and cooling, domestic hot water systems, lighting, and other energy-consuming components of a typical building envelope. The Applicant has made a preliminary commitment to making all new residential units 15 percent more energy efficient than required under the 2008 Title 24

[1097] City and County of San Francisco, *Better Streets Policy, Ordinance 33-06,* adopted by the San Francisco Board of Supervisors on February 6, 2006.
[1098] City and County of San Francisco, Municipal Transportation Agency, *Transit Effectiveness Project,* website: http://www.sfmta.com/cms/mtep/teprecs.htm, accessed August 31, 2009.
[1099] City and County of San Francisco, Municipal Transportation Agency, *San Francisco Bicycle Plan,* website: http://www.sfmta.com/cms/bproj/bikeplan.htm, accessed August 31, 2009.
[1100] Appendix G of the CEQA Guidelines requires that an EIR include a discussion of the potential energy impacts of a project, with a particular emphasis on avoiding or reducing the inefficient, wasteful, and unnecessary consumption of energy. The criteria provided for this analysis adequately cites the requirements of CEQA.
[1101] Modified from the CEC's *Statewide Residential Appliance Saturation Survey, Volume 2, Study Results, Final Report, June, 2004.*

standards as a project design feature by employing high performance glazing, efficient lighting, daylighting, natural ventilation, shading, envelope optimization, reflective roofs, insulation, radiant water heaters, design and installation of HVAC systems to ACCA Manual recommendations, building commissioning, and other energy efficiency measures. The Project energy use factors were adjusted to reflect the Project Applicant's commitment to reduce energy consumption below 2008 Title 24 standards and were used to estimate the energy that would be used by building envelopes, which are governed by Title 24. The energy consumption by non-residential uses (except for the proposed 49ers stadium) was estimated based on data from the Climate Change Technical Report (Appendix S).[1102]

Title 24-regulated energy use (cooling, space heating, water heating, lighting, ventilation) and plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) are presented in separate tables. Plug-in energy demand is not governed under Title 24 standards. Plug-in energy use is largely beyond the control of the Project Applicant, as most plug-in equipment would be installed by future occupants rather than by the Applicant. However, the Project Applicant has made a preliminary commitment to install ENERGY STAR[1103] appliances in newly built residences (for builder-supplied appliances) as an energy-saving measure. Because it is not clear which appliances would be chosen, the decrease in plug-in electricity use associated with ENERGY STAR appliances cannot be quantified at this time. Plug-in energy use is discussed qualitatively.

The *San Francisco Climate Action Plan* contains an estimate of the existing stadium's energy use. The stadium's existing electricity use is 5,100 MWh per year, and natural gas use is 9,000 MBtu per year.[1104] The new stadium would be more energy efficient than the old stadium, which was built in 1960. Based on estimates from other new football stadiums, the new stadium would use approximately 20 percent less electricity than the existing stadium.[1105] Thus, the energy use projections presented in the analysis below include a 20 percent reduction for stadium energy use.

Projected petroleum fuel use associated with Project vehicle trips was estimated by multiplying the Project vehicle miles traveled (VMT) from the *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*[1106] by Caltrans average fuel efficiencies for San Francisco.[1107] The analysis considers the Project's transportation demand management (TDM) programs and programs designed to shift trips to other modes of transportation in the analysis of the Project's overall energy efficiency.

Additionally, the Project's potential contribution to cumulative energy impacts is evaluated.

[1102] Modified from CEC, *California Commercial End-Use Survey*, website: http://www.energy.ca.gov/ceus/, accessed August 30, 2009.
[1103] The term ENERGY STAR is capitalized as is the convention used by the United States Environmental Protection Agency and Department of Energy.
[1104] City and County of San Francisco, Department of the Environment and Public Utilities Commission, *Climate Action Plan for San Francisco.*
[1105] The new stadium to be used by the New York Jets and Giants is expected to reduce energy consumption by 30 percent as compared to their old stadium. The new stadium to be used by the Dallas Cowboys is expected to reduce energy use by 20 percent as compared to their old stadium.
[1106] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Bayview Waterfront Project Transportation Study,* 2009.
[1107] California Department of Transportation, *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009.

Construction Impacts

Impact ME-1: Energy Use during Construction

Impact ME-1 **Construction activities associated with the Project would not result in the use of large amounts of energy, or use energy in a wasteful manner. (Less than Significant)** ***[Criterion R.a]***

Construction activities associated with the Project would require the following sources of energy:

- Electricity, for operation of hand tools, air compressors, mobile project offices, and security lighting
- Diesel, for grading and construction equipment, delivery trucks, and earth hauling trucks
- Gasoline, to fuel construction worker commute vehicles

Although natural gas is sometimes used as a construction fuel to minimize localized air quality impacts, the construction activities for this Project would not exceed health standards, and thus, would not require substitution of natural gas fuels for standard diesel fuels. Air quality parameters would be met using a phased-in diesel exhaust retrofit program for construction equipment, described in the Project Health Risk Assessment (Appendix H1 [Ambient Air Quality and Human Health Risk Assessment]).[1108] All lifts would be either propane or electrically powered.

The construction activities for the Project would not be expected to result in demand for fuel greater than any other similarly sized project in the region. Although the Project would be large, it would be constructed over a period of approximately 29 years and demand for electricity and fuels would be spread out over this timeframe. The Project has been broken down into construction phases; each of these phases is comparable to similar projects in terms of: activity types, duration, land use, development area, and fuel consumption.

Given these considerations, the construction-related energy use associated with the Project would not be large or wasteful and is considered less than significant. No mitigation is required.

Operational Impacts

Impact ME-2: Electricity Use in Large Amounts or a Wasteful Manner

Impact ME-2 **Buildings constructed by the Project would not use large amounts of electricity in a wasteful manner. (Less than Significant with Mitigation)** ***[Criterion R.a]***

Table III.R-7 (Project Electricity Demand from Plug-In Appliances [MWh]) presents the estimated Project electricity use for plug-in appliances. The Project would require approximately 59,616 MWh of electricity annually to supply plug-in appliances. Because plug-in electricity use depends on the appliances installed by future Project residents and employees, plug-in consumption would be difficult for the Project Applicant to influence. However, the Project Applicant's preliminary commitment to installing ENERGY

[1108] ENVIRON, 2009. *Ambient Air Quality Human Health Risk Assessment: Candlestick Point-Hunters Point Shipyard Phase II Development Plan.* The Health Risk Assessment analysis assumes that 50 percent of the construction equipment used would be retrofitted with after-market filters in 2010 and 2011, 75 percent would be retrofitted in 2012, and 100 percent would be retrofitted in 2013. Section III.H (Air Quality) indicates that air emissions from construction equipment would result in a less than significant impact.

STAR appliances into residential units for all builder-supplied appliances would result in a small decrease in plug-in energy use below the numbers shown.

Table III.R-7 Project Electricity Demand from Plug-In Appliances (MWh)

Type of Use	Energy Use Factor (MWh/gsf or unit)[a]	Candlestick Point		HPS Phase II		Project Site Total		Percent of Total by Land Use
		Development Program[b]	MWh Consumed Annually[c]	Development Program[b]	MWh Consumed Annually[c]	Development Program	MWh Consumed Annually	
Residential Units	1.7830[d]	7,850	13,997	2,650	4,725	10,500	18,722	31%
Retail	0.0096	635,000	6,077	—	—	635,000	6,077	10%
Neighborhood Retail	0.0096	125,000	1,196	125,000	1,196	250,000	2,392	4%
Office	0.0093	150,000	1,388	—	—	150,000	1,388	2%
R&D	0.0093	—	—	2,500,000	23,125	2,500,000	23,125	39%
Hotel	0.0069	220	2	—	—	220	2	0%
Artist Studios/ Center	0.0093	—	—	255,000	2,359	255,000	2,359	4%
Community Space	0.0093	50,000	463	50,000	463	100,000	926	2%
Arena	0.0073	75,000	548	—	—	75,000	548	1%
Stadium[e]	N/A	—	—	1,860,000	4,080	1,860,000	4,080	7%
Total			***23,671***		***35,948***		***59,619***	***100%***
Percent of Total			***40%***		***60%***			

SOURCES:

Baseline Project natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The electricity factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

b. Based on buildout floor areas provided in Table II-2 (Existing and Proposed Uses) of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The electricity factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor is in the "Plug-in" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

e. Electricity use for the Candlestick Park stadium was estimated in: City and County of San Francisco, 2004. *Climate Action Plan,* Table 2-4. Based on comparable energy savings achieved by other recently constructed stadiums, a 20 percent reduction in electricity use is anticipated with construction of the replacement stadium.

Table III.R-8 (Project Electricity Demand from Building Envelopes [MWh]) presents the projected electricity demand of the Project associated with building envelope design. The projected demand incorporates energy savings associated with the Applicant's preliminary commitment to planning, designing, and constructing the Project to reduce energy use to 15 percent below 2008 Title 24 standards. As shown, the electricity demand associated with Project building envelopes would be approximately 34,974 MWh. A similarly sized project that would not include the electricity reduction below 2008 Title 24 standards would result in consumption of approximately 40,426 MWh of electricity use annually.[1109]

[1109] Electricity use for the stadium is not governed under Title 24, thus, reductions in electricity use associated with the stadium are factored into both the Title 24 and 15 percent reduction scenarios presented in Table III.R-8.

Table III.R-8 Project Electricity Demand from Building Envelopes (MWh)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Electricity Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)*[a]	*Development Program*[b]	*MWh Consumed Annually, 2008 Title 24 Standards*[c]	*MWh Consumed Annually, with 15% Reduction*	*Development Program*[b]	*MWh Consumed Annually, Title 24 Standards*[c]	*MWh Consumed Annually, with 15% Reduction*	*Development Program*	*MWh Consumed Annually, Title 24 Standards*	*MWh Consumed Annually, with 15% Reduction*	*Percent of Total Electricity by Land Use*
Residential Units	1.7350[d]	7,850	13,620	11,577	2,650	4,598	3,908	10,500	18,218	15,485	45%
Retail	0.0027	635,000	1,715	1,457	—	0	0	635,000	1,715	1,457	4%
Neighborhood Retail	0.0027	125,000	338	287	125,000	338	287	250,000	676	574	2%
Office	0.0052	150,000	780	663	—	0	0	150,000	780	663	2%
R&D	0.0052	—	0	0	2,500,000	13,000	11,050	2,500,000	13,000	11,050	32%
Hotel	0.0027	220	1	1	—	0	0	220	1	1	0%
Artist Studios/ Center	0.0052	—	0	0	255,000	1,326	1,127	255,000	1,326	1,127	3%
Community Space	0.0052	50,000	260	221	50,000	260	221	100,000	520	442	1%
Arena	0.0015	75,000	113	96	—	0	0	75,000	113	96	0%
Stadium[e]	N/A	—	0	0	1,860,000	4,080	4,080	1,860,000	4,080	4,080	10%
Total			***16,827***	***14,302***		***23,602***	***20,673***		***40,429***	***34,975***	***100%***

SOURCES:

Project electricity demand was estimated based on the Applicant's commitment to achieve 15 percent energy reductions below Title 24 standards and use ENERGY STAR appliances in all residential units.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15% Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. Based on buildout floor areas provided in Table II-2 (Existing and Proposed Uses) of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The electricity factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

e. Electricity use for the Candlestick Park stadium was estimated in: City and County of San Francisco, 2004. *Climate Action Plan,* Table 2-4. Based on comparable energy savings achieved by other recently constructed stadiums, a 20 percent reduction in electricity use is anticipated with construction of the replacement stadium.

The combined annual electricity use of the Project, including both building envelope consumption and plug-in electricity use would be 94,590 MWh,[1110] not taking into account reductions associated with the use of ENERGY STAR appliances or green building measures beyond the Project Applicant's preliminary commitment to reduce energy use 15 percent below 2008 Title 24 standards.

The threshold for this impact considers whether the Project would result in a large increase in electricity consumption. The electricity use at the Project site, following implementation of energy efficiency measures, would represent approximately 1.8 percent of the City's total electricity consumption of 5,155 million kWh, and would result in approximately ten times the existing electricity use of 9,457 MWh at the Project site. This would be a large overall increase in consumption because much of the Project site is unoccupied and undeveloped; however, on a per-square-foot basis, the Project would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

In addition, the Project would be required to comply with the City's Green Building Ordinance. The Green Building Ordinance requires newly constructed commercial buildings over 5,000 gsf, residential buildings over 75 feet in height, and renovations on buildings over 25,000 gsf to meet LEED® or other green building standards. Individual buildings would incorporate various green building specifications to meet the Green Building Ordinance and, in some cases, seek LEED® certification, or an equivalent certification for these buildings. While specific green building measure cannot be identified until building designs have been completed, examples of measures that could be implemented by the Project in compliance with the Green Building Ordinance include high performance glazing, shading, envelope optimization, reflective roofs, and natural ventilation (reducing energy use for heating and cooling), natural and energy efficiency lighting (reducing energy for artificial lighting), reduced water consumption (reducing energy use associated with the conveyance of water and wastewater), and energy commissioning, a process that requires verification, monitoring, and regular maintenance of energy systems to achieve peak performance.

The Project Applicant has also made a preliminary commitment to voluntarily implement LEED® for Neighborhood Development (LEED® ND) standards based on the Pilot Version of the rating system released in June 2007.[1111] While most LEED® standards apply to individual structures, the new LEED® ND standards apply principles of smart growth, urbanism, and green building into a certification system for overall neighborhood design. LEED® ND was designed through collaboration between the USGBC, the Congress for the New Urbanism, and the Natural Resources Defense Council and would provide independent, third-party verification that the development's location and design meet accepted high levels of environmentally responsible, sustainable development. A preliminary analysis indicates the Project could achieve approximately 63 LEED® ND credits, which would make the Project eligible for Gold certification under LEED® ND 2007.[1112,1113] Points would be achieved through strategies including, but not limited to, the following:

[1110] Plug-in energy use (59,616 MWh) + building envelope energy use (34,974 MWh) = 94,590.

[1111] Since the initial release of the ND standard, the rating system has undergone two public comment periods, and several credit requirements have changed. The LEED® ND rating system is currently being finalized for formal release by the USGBC.

[1112] These numbers are preliminary estimates by ARUP, 2009. The Project Applicant has not yet committed to seeking certification under the modified standards.

[1113] LEED® certification is obtained by demonstrating compliance with a number of design and construction credits. For example, a project that receives 60 to 79 credits receives Gold certification. The Applicant would design and

- Compact, infill development (including 90 percent of the new buildings fronting on public streets or open space)
- Enhanced habitat values
- Brownfield remediation and urban reuse
- Close proximity to transit and bicycle networks (75 percent of all development would be within ¼ mile walk to a transit stops, and Class I, II, and III bikeways would provide connections throughout the site and to the greater Bayview community)
- Urban design that promotes walking and discourages driving
- Diversity of land uses and housing types
- Affordable housing that supports a community of mixed ages and income
- Community participation in community planning and design
- ENERGY STAR compliance to be documented by a Home Energy Rating System (HERS)
- Drought tolerant plant species and the use of efficient irrigation systems such as drip irrigation, moisture sensors, and weather data-based controllers
- Tree-lined streets throughout the development and streetscape improvements extending from the Project Site to Third Avenue along Gilman and Palou
- Access to public space and recreational amenities through the creation of parks and playfields
- Efficient use of water and the potential use of recycled water for non-potable water uses such as irrigation, toilets, vehicle washing
- Stormwater management practices that would retain and treat stormwater on site and/or in adjacent areas

Although additional energy savings associated with implementation of the City's Green Building Ordinance and the LEED® ND standards cannot be modeled until designs have been completed, these measures could further decrease the energy consumption presented in Table III.R-8.

To reduce peak demand on existing electricity infrastructure and to further State and local renewable energy policies, the Applicant would implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity; the use of solar thermal energy to provide space cooling with the use of absorption systems; and/or water for space heating and domestic water systems. The specifics of the Project's renewable energy programs have not yet been developed.

Taking the Project's compliance with the Green Building Ordinance and its voluntary implementation of energy-saving design features into consideration, as well as the level of development proposed, the electricity increase associated with the Project would not be considered large.

The City's threshold also considers whether the Project's energy consumption would be wasteful. The efficiency measures proposed under the Project would result in building envelope consumption of at least 15 percent less electricity than a project that would not implement such measures. Further electricity savings would be anticipated as a result of the Project's compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and the Project's voluntary implementation of LEED® ND standards. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and

develop buildings to comply with the Green Building Ordinance, and, meet LEED® or equivalent requirements; however, the Applicant may choose not to seek and obtain LEED® certification for every building developed.

not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and mitigation measure MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts to less than significant.

Impact ME-3: Natural Gas Use in Large Amounts or a Wasteful Manner

Impact ME-3 **Buildings constructed by the Project would not use large amounts of natural gas in a wasteful manner. (Less than Significant with Mitigation)** ***[Criterion R.a]***

Table III.R-9 (Project Natural Gas Demand, Baseline [MBtu]) presents the annual natural gas use for the Project, estimate based on land use and minimal compliance with Title 24 standards as well as the Project Applicant's preliminary commitment to reduce energy use to 15 percent below Title 24 standards. The natural gas demand associated with the Project would be approximately 63,263 MBtu, in comparison to a similarly sized project that would not include the 15 percent reduction below 2008 Title 24 standards and which would result in consumption of approximately 73,156 MBtu of natural gas use annually.[1114]

The natural gas use at the Project site would represent less than 1 percent of the City's overall natural gas consumption of 28,918,000 million Btus, and overall natural gas demand would be over four times higher than under existing conditions, largely attributable to R&D uses at HPS Phase II. Natural gas use would be roughly three and a half times higher at HPS Phase II than at Candlestick Point due to peak daytime demand from R&D uses. However, on a per-square-foot basis, the Project would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

As described under Impact ME-2, the Project would be required to comply with the City's Green Building Ordinance and has voluntarily committed to constructing the Project to the LEED® ND Gold standard based on the Pilot Version of the rating system released in June 2007.[1115] Although energy savings associated with these programs could vary based on the credits chosen and, therefore, cannot be accurately quantified, additional energy savings, beyond those shown in Table III.R-9, are anticipated.[1116]

[1114] Electricity use for the stadium is not governed under Title 24, thus, reductions in electricity use associated with the stadium are factored into both the Title 24 and 15 percent reduction scenarios presented in Table III.R-8.
[1115] Since the initial release of this standard, the rating system has undergone two public comment periods, and several credit requirements have changed. The LEED® ND rating system is currently being finalized for formal release by the USGBC.
[1116] LEED® certification is obtained by demonstrating compliance with a number of design and construction credits. For example, a project that receives 60 to 79 credits receives Gold certification. The Applicant would design and develop buildings to comply with the S.F. Green Building Ordinance, and, meet LEED or equivalent requirements; however, the Applicant may choose not to seek and obtain LEED certification for every building developed.

Table III.R-9 Project Natural Gas Demand, Baseline (MBtu)

Type of Use	Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)[a]	Candlestick Point			HPS Phase II			Project Site Total			
		Development Program[b]	MBtu Consumed Annually, 2008 Title 24 Standards[c]	MBtu Consumed Annually, with 15% Reduction	Development Program[b]	MBtu Consumed Annually, 2008 Title 24 Standards[c]	MBtu Consumed Annually, with 15% Reduction	Development Program	MBtu Consumed Annually, 2008 Title 24 Standards[c]	MBtu Consumed Annually, with 15% Reduction	Percent of Total by Land Use
Residential Units	0.0360[d]	7,850	283	240	2,650	95	81	10,500	378	321	1%
Retail	0.0048	635,000	3,048	2,591	—	—	—	635,000	3,048	2,591	4%
Neighborhood Retail	0.0048	125,000	600	510	125,000	600	510	250,000	1,200	1,020	2%
Office	0.0200	150,000	3,000	2,550	—	—	—	150,000	3,000	2,550	4%
R&D	0.0200	—	—	—	2,500,000	50,000	42,500	2,500,000	50,000	42,500	68%
Hotel	0.0345	220	8	6	—	—	—	220	8	6	0%
Artist Studios/ Center	0.0200	—	—	—	225,000	4,500	3,825	225,000	4,500	3,825	7%
Community Space	0.0200	50,000	1,000	850	50,000	1,000	850	100,000	2,000	1,700	3%
Arena	0.0243	75,000	1,823	1,549	—	—	—	75,000	1,823	1,549	2%
Stadium[e]	N/A	—	—	—	1,860,000	7,200	7,200	1,860,000	7,200	7,200	10%
Total			***9,762***	***8,296***		***63,395***	***54,966***		***73,157***	***63,262***	***100%***
Percent of Total			***13%***			***87%***			***100%***		

SOURCES:

Baseline Project natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The natural gas factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

b. Based on buildout floor areas provided in Table II-2 (Existing and Proposed Uses) of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The natural gas factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor is in the "Natural Gas Delivered, Total" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

e. Natural gas use for the Candlestick Park stadium was estimated in: City and County of San Francisco, 2004. *Climate Action Plan,* Table 2-4. Based on comparable energy savings achieved by other recently constructed stadiums, a 20 percent reduction in natural gas use is anticipated with construction of the replacement stadium.

However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts to less than significant.

Impact ME-4: Vehicle-Trip Energy Use in Large Amounts or a Wasteful Manner

Impact ME-4 **Vehicle trips associated with the Project would not use large amounts of energy in a wasteful manner. (Less than Significant with Mitigation)** ***[Criterion R.a]***

The Project would increase trips to and from the Project site, increasing the use of petroleum fuels. Based on average fuel efficiencies for the City of San Francisco and the Project VMT (reported in the *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*), the Project would result in a demand for 14.01 million gallons of gasoline and 0.93 million gallons of diesel annually (refer to Table III.R-10 [Project Petroleum Demand]).

Table III.R-10 Project Petroleum Demand

	Project Annual VMT (million miles travelled)[a]	*Average Countywide Vehicle Fuel Efficiency (2030)*[b]	*Project Total Fuel Consumption (million gallons)*	*Project Gasoline Consumption (million gallons)*[c]	*Project Diesel Consumption (million gallons)*[c]
Candlestick Point	223.67	21.15	10.58	9.92	0.66
Hunters Point Shipyard	92.36	21.15	4.37	4.09	0.27
Total	*316.03*		*14.95*	*14.01*	*0.93*

SOURCES:

a. Annual VMT was calculated by PBS&J based on trip generation information and average trip lengths reported in: CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study,* 2009.

b. Equals the projected 2030 VMT (3,495 million miles travelled) divided by the projected total transportation fuel consumed (171.27 million gallons) for San Francisco County, as reported in: California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009. This factor does not take into account recently adopted fuel efficiency standards.

c. On average 94 percent of the transportation fuels consumed in San Francisco were gasoline fuels, while 6 percent were diesel fuels, as reported in: California Department of Transportation (Caltrans), *California Motor Vehicle Stock, Travel and Fuel Forecast*, website: http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff08.pdf, accessed August 20, 2009.

The use of fuels resulting from Project-related travel to and from the Project site would be five times higher than under existing conditions, a large increase in consumption. However, this consumption would not be wasteful because (1) the Project proposes to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements that would encourage alternative travel modes; (2) the Project would include a transportation demand management (TDM) program designed to reduce the remaining vehicle trips; and (3) the Project would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. Project design features and programs that would increase the efficiency of transportation activities associated with the Project are described in Section III.D (Transportation and Circulation) and summarized below.

Transit Improvements: The Project proposes to implement the following transit improvements (described in Section III.D):

- Extended existing Muni Service and increased frequency
- Harney/Geneva BRT/Transit Preferential Street
- Hunters Point Transit Center
- Bus Rapid Transit Stops
- Palou Avenue Transit Preferential Street

Bicycle Network Improvements: Currently, the Project site has little in the way of existing bicycle amenities and trail connections. The Project would include the construction of the Bay Trail throughout the Project site, including connections to the existing and new parks from the western boundary of Candlestick Point near the Harney Way/US-101 interchange, through the Candlestick Point State Recreation Area (CPSRA), Yosemite Slough, and HPS Phase II shoreline to India Basin. The Bay Trail would be incorporated into the Yosemite Slough bridge, which would serve bus transit and pedestrian and bicycle routes between Candlestick Point and HPS Phase II. Bikeways would provide connections within the Project site and to the surrounding neighborhoods and other parts of the City. Bicycle lanes would be provided along major roadways, consistent with City guidelines, and it is anticipated that as the street network develops, the bicycle facilities would be incorporated into the City's official bicycle route network. There would be bicycle parking in each commercial parking facility and residential garages. New commercial buildings with at least 20,000 gsf of floor area, as well as other facilities and attractions would provide locker and shower facilities.

Pedestrian Network Improvements: The Project proposes to enhance the pedestrian network at the Project site. The pedestrian network would encourage walking as a primary mode of transportation at the Project site. Pedestrian facilities, including sidewalk and multi-use pathways, would allow access to transit facilities and to shopping, schools, and recreation. The interior roadway network would include traffic calming features to facilitate safe pedestrian travel. The streets would be designed to accommodate multi-modal travel with features including curb extensions, intersection bulb-outs, raised crosswalks, comprehensive signage, street trees, narrow roadway lanes, and short blocks and other features to slow auto traffic. All pedestrian facilities would meet ADA standards.

Transportation Demand Management (TDM) Programs: The Project TDM programs would be designed to reduce use of single-occupant vehicles and to increase the use of rideshare, transit, bicycle and walk modes for trips to and from, as well as within the Project. In addition, the TDM plan would include measures to reduce the demand for travel during peak times. The TDM plan would include the following strategies (described in Section III.D):

- Transportation Coordinator and Website
- Employee TDM Programs
- Carpool/Vanpools
- Carshare Services
- Transit Passes
- Outreach

- Unbundled Residential Parking
- Parking Fees
- Dedicated Bicycle and Bus Lanes

Finally, the Project would be an infill project within a developed urban area that would provide access to employment, retail, and recreational opportunities. The VMT for the Project anticipates shorter and fewer trips as a result of the proposed density and mixed uses at the Project site.

As a result of these Project features and programs, between 28 and 34 percent of the weekday AM and PM peak hour person trips would be internal pedestrian trips within the Project site, according to the Transportation Study (Appendix D).[1117] Of the remaining external trips, 21 percent would be conducted via transit and 3 percent would be conducted via bicycle.[1118] The shift to non-vehicular modes of travel would result in savings in transportation fuels. Over time, implementation of the State Alternatives Fuels Plan (see Regulatory Framework) is expected to increase the efficiency of vehicle trips, result in the development of alternative fuels, and shift trips to non-vehicular modes of travel. Project programs, in combination with local and State policies, would minimize vehicular fuel use.

In summary, the programs proposed under the Project for minimization of trips, as well as the Project's density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. However, in an abundance of caution and because Project site plans are in a preliminary state, mitigation measures MM TR-1 through MM TR-5, requiring implementation of specified circulation improvements that would minimize VMT, are applied to the Project. Following implementation of these mitigation measures, impacts would be considered less than significant.

Cumulative Impacts

The geographic context for evaluation of cumulative energy impacts is the Bayview Hunters Point neighborhood. The past and present development is described in the Setting section of this chapter, representing the baseline conditions for evaluation of cumulative impacts. Reasonably foreseeable future development includes Executive Park, Jamestown, Hunters Point Shipyard Phase I, Hunters View, and India Basin Shoreline. These areas contain a mixture of land uses, including residential, commercial, and industrial uses. The past and present development in these areas is described in Section III.B. Reasonably foreseeable future development forecasts are based on projections of future growth and take into account projects going through the entitlement process.

All development anticipated under the cumulative scenario, including the Project, would be expected to comply with the energy efficiency standards in Title 24, and, for those projects exceeding certain size thresholds, the City's Green Building Ordinance. In accordance with these requirements, all proposed developments would use site and building design strategies similar to those employed by the Project to discourage wasteful energy consumption. While it is not certain that other developments would commit to

[1117] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*, 2009.
[1118] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*, 2009.

the 15 percent reduction in energy consumption (below Title 24 standards) that is proposed under the Project, the cumulative demand for electricity and natural gas would be reduced through implementation of the City's *Building Code* policies and incentives. Electricity and natural gas consumption would therefore be less than significant.

Petroleum consumption associated with the new development identified above would be primarily attributable to transportation, especially private automobile use. However, the cumulative study area is an urban area, with a range of alternative transportation options. As development in the cumulative study area occurs, the development pattern over time, allowing greater walkability. Increased population density and mixed-use development would allow residents to work, shop, and live within a small area, reducing average trip lengths, which would in turn result in lower consumption of fuels. Pedestrian and bicycle amenities would be enhanced in the cumulative study area as a result of City programs, contributing to a reduction in vehicular travel. These considerations would reduce wasteful petroleum consumption associated with unnecessary automobile trips and long commutes. State fuel efficiency standards and alternative fuels policies contained in the State Alternatives Fuels Plan (see Regulatory Framework) would also contribute to a reduction in fuel use.

For all of these reasons, the cumulative construction and operational impact with regard to the consumption of energy resources would be less than significant.

SECTION III.S GREENHOUSE GAS EMISSIONS

III.S.1 Introduction

It is widely recognized that emissions of greenhouse gases[1119] (GHG) associated with human activities are contributing to changes in the global climate, and that such changes are having and would have adverse effects on the environment, the economy, and public health. These changes are the cumulative effects of past, present, and future actions worldwide. While worldwide contributions of greenhouse gases are expected to have widespread consequences, in general, currently it is not possible to correlate specific greenhouse gas emissions from a particular source or location with a climate change or associated environmental impacts of climate change at another location in California or the world. It is possible to quantify the greenhouse gases that would be emitted either directly from Project sources or indirectly from other sources, such as production of electricity used at the Project. However, those emissions cannot be tied to a particular adverse climate change effect on the environment.

During build-out and operation of the Project, greenhouse gases would be emitted as the result of construction activities; changes in vegetation sequestration capacity; new direct operational sources, such as natural gas usage; and indirect operational sources, such as production of electricity used at the Project, transport of water, and decomposition of Project-related wastes. Greenhouse gases would also be emitted by residents, visitors, and employees travelling to and from the Project site. This environmental impact report (EIR) estimates the Project's greenhouse gas emissions and discusses the Project's contribution to worldwide emissions of greenhouse gases.

The State of California, through the *California Global Warming Solutions Act of 2006*, Assembly Bill (AB) 32, and Executive Order S-3-05, has set statewide targets for the reduction of greenhouse gas emissions (refer to the Section III.S.3 [Regulatory Framework]). "The goal of AB 32 and S-3-05 is the significant reduction of future greenhouse gas emissions in a state that is expected to rapidly grow in both population and economic output."[1120] Accordingly, to achieve the state's goals, there would have to be a significant reduction in per capita greenhouse gas emissions.

For this EIR, emissions from nine categories of direct and indirect GHG emissions are estimated: emissions due to changes in vegetation sequestration, emissions from construction activities, residential building emissions, non-residential building emissions, mobile source emissions, municipal emissions, area sources, solid waste, and transit services. All emissions inventories are presented in metric tons unless otherwise indicated. An analysis of the life-cycle emissions associated with building materials was also prepared but not considered in the main emissions inventory.

The emissions inventory presented in this report was developed using guidance from two government-sponsored organizations to assist in the estimation of GHG emissions. These are the methodologies established by the California Climate Action Registry (CCAR) or the Intergovernmental Panel on Climate

[1119] For the purposes of this analysis, the term "greenhouse gases" refers to carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, those gases regulated under the California Global Warming Solutions Act of 2006 (Assembly Bill 32).
[1120] CAPCOA, 2008. *CEQA and Climate Change*, p. 32.

Change (IPCC), where possible. A variety of methods are employed to develop a complete emissions inventory including using studies commissioned by the California Energy Commission (CEC) providing data on energy use patterns associated with municipal activities, natural resource distribution, and other activities that would take place at the Project. In addition to CEC studies, studies performed by individual municipalities or scientific organizations are also used. Several publically available models and software programs developed by California agencies were used to assist in calculation of emissions. These include OFFROAD 2007, EMFAC2007, and Urban Emissions Model (URBEMIS). Sources used for this section include *Climate Change Technical Report for the Candlestick Point–Hunters Point Shipyard Phase II Project* (Environ 2009), included as Appendix S (Climate Change Technical Report), and information from the City and County of San Francisco Climate Action Plan (SFCAP), California Air Resources Board (ARB), and the California Climate Action Team (CAT).

III.S.2 Setting

Overview of Climate Change

Global climate change is a broad term used to describe any worldwide, long-term change in the earth's climate. This change could be, for example, an increase or decrease in temperatures, the start or end of an ice age, or a shift in precipitation patterns. The term global warming is a more specific type of global climate change and refers to a general increase in temperatures across the earth. These rising temperatures can cause other climatic changes, such as a shift in the frequency and intensity of rainfall or hurricanes. Global warming does not necessarily imply that all locations would be warmer. Some specific, unique locations may be cooler even though the world, on average, is warmer.

Some gases in the atmosphere affect the Earth's heat balance through the greenhouse effect by absorbing infrared radiation. This layer of gases in the atmosphere prevents the heat from escaping. These gases are known as greenhouse gases. Naturally occurring GHGs have been present at relatively stable levels in the atmosphere for millennia. Examples of these natural GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor. In addition to these natural GHGs, there are several other man-made GHGs, including but not limited to: sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons.

As human industrial activity increased, the concentrations of GHGs in the atmosphere have increased. There is a general scientific consensus that most current global warming is the result of human activity on the planet. It is widely accepted that continued increases in GHG emissions would contribute to global climate change although there is uncertainty concerning the magnitude and timing of future emissions and the resultant warming trend. Human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors contribute to these GHG emissions. The ARB reported that transportation was the largest sector contributing to GHG emissions at 38 percent of the state's 2004 GHG emissions, followed by electricity generation.[1121]

The effect that each of these gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). As shown in Table III.S-1 (Global Warming

[1121] California Air Resources Board. 2007. *Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emission Limit*, November 16. http://www.arb.ca.gov/cc/ccei.htm.

Potentials of Select Greenhouse Gases), GWP indicates, on a pound for pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. CH_4 and N_2O are substantially more potent GHGs than CO_2, with GWPs of 21 and 310, respectively.[1122] The GWP of a specific GHG depends on the absorption of infrared radiation by a GHG, the spectral location of its absorbing wavelengths, and the atmospheric lifetime of the GHG. In emissions inventories, GHG emissions are typically reported in terms of pounds (lbs) or tonnes[1123] of CO_2 equivalents (CO_2e). CO_2e are calculated as the sum of the product of the mass emitted of all six GHG and the GHG's specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from residential developments and human activity in general (ENVIRON, p. 1).

Table III.S-1 Global Warming Potentials of Select Greenhouse Gases

Gas	*Global Warming Potential (100 year time horizon)*
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310
HFC-23	11,700
HFC-134a	1,300
HFC-152a	140
PFC: Tetrafluoromethane (CF_4)	6,500
PFC: Hexafluoroethane (C_2F_6)	9,200
Sulfur Hexafluoride (SF_6)	23,900

SOURCE: California Climate Action Registry. 2009. General Reporting Protocol Version 3.1. January

Water vapor is an important GHG, but is not recognized by international conventions because there is not an obvious correlation between water concentrations and specific human activities. Water vapor concentrations appear to act in a positive feedback manner; higher temperatures lead to higher water vapor concentrations.[1124]

Each of the six GHGs that are regulated by the Kyoto accords and the State of California[1125] are discussed below:

[1122] GWP values from IPCC's Second Assessment Report (SAR, 1996) are still used by international convention and are used in this protocol, even though more recent (and slightly different) GWP values were developed in the IPCC's Third Assessment Report (TAR, 2001).
[1123] In this report, "tonnes" would be used to refer to metric tonnes (1,000 kilograms). "Tons" would be used to refer to short tons (2,000 pounds).
[1124] IPCC. Third Assessment Report.
[1125] Governor Schwarzenegger recently added nitrogen trifluoride to the list regulated by the state of California. Nitrogen trifluoride is used primarily in the microelectronics industry.

Carbon dioxide (CO_2) is an odorless, colorless gas, which has both natural and anthropogenic (arising from human activities) sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of carbon dioxide are from burning coal, oil, natural gas, and wood. Concentrations of carbon dioxide were 379 parts per million (ppm) in 2005, which equates to an increase of 1.4 ppm per year since 1960.[1126] CO_2 is the most common greenhouse gas generated by California activities, constituting approximately 84 percent of all greenhouse gas emissions.[1127] CO_2 emissions attributed to California activities are mainly associated with in-state fossil fuel combustion and fossil fuel combustion in out-of-state power plants supplying electricity to California. Other activities that produce CO_2 emissions include mineral production, waste combustion, and land use changes that reduce vegetation.

Methane (CH_4) is a flammable gas and is the main component of natural gas. When one molecule of methane is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are landfills, fermentation of manure, and cattle.

Nitrous oxide (N_2O), also known as laughing gas, is produced naturally by microbial processes in soil and water. Anthropogenic sources of nitrous oxide include agricultural sources, industrial processing, fossil fuel-fired power plants, and vehicle emissions. Nitrous oxide also is used as an aerosol spray propellant and in medical applications.

Other gases that contribute to the greenhouse effect include ozone,[1128] chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and aerosols. However, these latter greenhouse gases are generally emitted during industrial processes that are not expected at the Candlestick Point–Hunters Point Shipyard Phase II Redevelopment. This analysis, therefore, considers those GHGs most likely to be emitted by the Project: carbon dioxide, nitrous oxide, and methane.

Candlestick Point–Hunters Point Shipyard Phase II Redevelopment Plan residents, employees, and patrons of commercial and municipal buildings use electricity, heat their homes and water, and are transported in motor vehicles, all of which directly or indirectly emit GHGs. The principal GHGs emissions resulting from such developments are CO_2, CH_4, and N_2O. CO_2 is considered the most important GHG, due primarily to the large emissions produced by fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles. CH_4 and N_2O are also emitted by fossil fuel combustion, though their emissions are much less significant than CO_2. CH_4 is also emitted from the transmission, storage, and incomplete combustion of natural gas (ENVIRON, p. 1) and landfills.

[1126] IPCC, 2007. R.B. Alley et al. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Summary for Policymakers.

[1127] CEC, 2007. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*.

[1128] Ozone is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change. California Environmental Protection Agency, 2004. Technical Support Document for Staff Proposal Regarding Reduction of Greenhouse Gas Emissions from Motor Vehicles Climate Change Overview.

Scientific Assessment of Climate Change Scenarios

As GHG emissions increase, temperatures in California are projected to rise over the twenty-first century. The modeled magnitudes of the warming vary because of uncertainties in future emissions and the climate's sensitivity. According to a CEC report,[1129] projected warming scenarios predict temperatures to increase between 3.6 to 9ºF by 2100. To comprehend the magnitude of these projected temperature changes over the next century, the lower range is slightly larger than the difference in annual temperature between Monterey and Salinas, which is 2.5ºF, and the upper range of the warming is greater than the temperature difference between San Francisco and San Jose, which is 7.4ºF. Rising temperatures could have a variety of impacts, including stress on sensitive populations (e.g., sick and elderly), additional burden on building systems (e.g., demand for air conditioning), and, indirectly, increasing emissions of greenhouse gases and criteria pollutants associated with energy generation. It is not possible to reliably quantify these risks at this time.

The California Resources Agency (CRA)[1130] recently prepared a document that discusses the impacts of climate change upon California. CRA reports that extreme natural events are likely to occur, including higher nighttime temperatures and longer, more frequent heat waves overall; 12 to 35 percent decrease in precipitation levels by mid- to late-twenty-first century; increased evaporation and faster incidences of snowmelt that would increase drought conditions, and more precipitation in the form of rain as compared to snow that would decrease water storage in California during the dry season and increase flood events during the wet season.[1131]

CRA also states that climate change would intensify California's "Mediterranean climate pattern," with the majority of annual precipitation occurring between November and March and drier conditions during the summer.[1132] This would increase droughts and floods and would affect river systems. Climate change is expected to alter seasonal and inter-annual patterns of precipitation. These changes continue to be one of the most uncertain aspects of future scenarios. For this Project, the most relevant direct impacts are likely to be changes in the timing and volume of stormwater runoff and changes in demand for irrigation. It is not possible to reliably quantify the implications of these changes at this time.

Another impact of global climate change is increased fire hazard. Changes in temperature and precipitation may combine to alter risks of wildfire. Fire is an important natural disturbance within many California ecosystems that promotes vegetation and wildlife diversity, releases nutrients, and eliminates heavy fuel accumulations that can lead to catastrophic burns. The changing climate could alter fire regimes in ways that could have social, economic, and ecological consequences. As the existing climate throughout California changes over time, mass migration of species, or worse, failure of species to migrate in time to adapt to the changes in climate, could also result. Due to its weather, topography, and native vegetation, nearly all Northern California is at some risk from wildland fires also called wildfires. The extended droughts characteristic of California's Mediterranean climate result in large areas of dry vegetation that

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1129 Cayan, D. et al. 2009. *Climate Change Scenarios and Seal Level Rise Estimates for the California 2008 Climate Change Scenarios Assessment*. PIER Research Report, CEC-500-2009-014, California Energy Commission.
1130 California Natural Resources Agency. *2009 California Climate Adaptation Strategy*. Discussion Draft.
1131 Cayan, Dan, Mary Tyree, Mike Dettinger, Hugo Hidalgo, Tapash Das, Ed Maurer, Peter Bromirski, Nicholas Graham, and Reinhard Flick (2009). *Climate Change Scenarios and Sea Level Rise Estimates for the California 2008 Climate Change Scenarios Assessment*. PIER Research Report, CEC-500-2009-014, Sacramento, CA: California Energy Commission.
1132 Cayan et al. 2009.

provide fuel for wildland fires that can spread into urban areas. Wildland-urban fires occur when a fire burning in wildland vegetation gets close enough to ignite urban structures. Areas of dense, dry vegetation, particularly in canyon areas and hillsides pose the greatest wildland fire potential. Changes in wildfire hazard have the potential to impact the Project; however, it is not possible to reliably quantify the implications of these changes at this time.

Changes in temperature and precipitation may also influence seasonal and inter-annual availability of water supplies. Consequently, it is reasonable to consider that climate change may affect water supply reliability. It is not possible to reliably quantify these risks for the Project at this time.

CRA states that sea level rise can cause damage to coastal communities and loss of land. A detailed discussion of sea level rise predictions is provided in Section III.M (Hydrology and Water Quality) of this EIR. The San Francisco Bay Conservation and Development Commission (BCDC) has prepared maps for areas inundated by 16 inches of sea level rise by 2050 and 55 inches of sea level rise by 2100.[1133] Therefore, extrapolating BCDC projections to the 2075 mid-point, sea level rise would be about 36 inches (3 feet), although some studies have concluded this rise would not occur until after the year 2100.[1134]

The CRA also notes that an emerging effect from climate change may be acidification (i.e., a decrease in the pH of the ocean water, making it more acidic.) of the ocean. In turn, acidification would affect the ability of hard-shelled invertebrates to create their skeletal structures.[1135] The implications of this change being major losses to shellfish industries, and shifts in food resources for ocean fisheries. The primary contributing factors were cited as increasing levels of CO_2 and weather pattern shifts. Increases in CO_2 result in increased uptake (i.e., absorption of the CO_2 into the ocean water) by the oceans, which result in decreased pH (acidification). Weather pattern shifts change the amount of calcium carbonate being delivered by rivers from sources stored in rocks, which further exacerbates the ability of invertebrates to form calcified shells.[1136]

One of the main contributing factors to CO_2, outside of human influences, is melting permafrost. When permafrost thaws, it releases carbon into soil or beneath lakes and releases CO_2 and methane into the atmosphere. Scientists are now estimating that there is more than twice the total amount of carbon stored in permafrost as there is in atmospheric carbon dioxide, and "could amount to roughly half those resulting from global land-use change during this century."[1137]

The importance of addressing climate impacts for California was recognized with Executive Order S-13-08 which called on state agencies to develop California's first strategy to identify and prepare for these expected climate impacts. In response to S-13-08, CRA has developed a draft adaptation strategy. CRA

1133 San Francisco Bay Conservation and Development Commission (BCDC), April 7, 2009, *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline,* Draft Staff Report.
1134 Moffatt & Nichol, *Candlestick Point/Hunters Point Development Project Initial Shoreline Assessment*, prepared for Lennar Urban, February, 2009, op. cit.
1135 Risien, J. (ed.). 2009. *West Coast Regional Marine Research and Information Needs*. Corvallis, Oregon: Oregon Sea Grant. ORESU-Q-09-001.
1136 Griffith, E.M., A. Paytan, K. Caldeira, T. D. Bullen and E. Thomas. 2008. A dynamic marine calcium cycle during the past 28 million years. Science. December 12, 2008.
1137 Schuur, E.A.G. et al. 2008. Vulnerability of Permafrost Carbon to Climate Change: Implications for the Global Carbon Cycle. *BioScience.* 58(8): 701–714.

recognizes that mitigation of GHG emissions is not the only means of dealing with climate change. The CRA report states "To effectively address the challenges that a changing climate would bring, climate adaptation and mitigation (i.e., reducing state GHG emissions) policies must complement each other, and efforts within and across sectors must be coordinated." Adaptation refers to efforts to respond to the impacts of climate change not avoidance of the change. Adaptation is adjustments in natural or human systems to actual or expected climate changes to minimize harm or take advantage of beneficial opportunities. In the 2009 California Climate Adaptation Strategy Discussion Draft, the CRA made several recommendations. Key recommendations include:

- Appointment of a Climate Adaptation Advisory Panel
- Improved water management in anticipation of reduced water supplies, including a 20 percent reduction in per capita water use by 2020
- Consideration of project alternatives that avoid significant new development in areas that cannot be adequately protected from flooding due to climate change
- Preparation of agency-specific adaptation plans, guidance or criteria by September 2010
- Consideration of climate change impacts for all significant state projects
- Assessment of climate change impacts on emergency preparedness
- Identification of key habitats and development of plans to minimize adverse effects from climate change
- Development of guidance by the California Department of Public Health by September 2010 for use by local health departments to assess adaptation strategies
- Amendment of Plans to assess climate change impacts and develop local risk reduction strategies by communities with General Plans and Local Coastal Plans
- Inclusion of climate change impact information into fire program planning by state fire fighting agencies

Additional Climate Change Impacts

Ecosystems and Biodiversity[1138]

Climate change is expected to have effects on diverse types of ecosystems, from alpine to deep-sea habitat. As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels."[1139] Shifts in existing biomes could also make ecosystems vulnerable to invasive species encroachment. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

[1138] EPA, 2008. *Climate Change – Ecosystems and Biodiversity*. http://www.epa.gov/climatechange/effects/eco.html (accessed January 3, 2009).

[1139] IPCC, 2007: *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom, 1,000 pp.

Human Health Impacts[1140]

Climate change may increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects: malaria, dengue fever, yellow fever, and encephalitis. Cholera, which is associated with algal blooms, could also increase. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase smog and particulate pollution, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency, and could adversely affect the elderly, children, and the homeless. Finally, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

Greenhouse Gas Emissions Inventories

Worldwide emissions of GHGs in 2004 were 26.8 billion tonnes of CO_2e.[1141] In 2004, the US emitted about 7 billion tonnes of CO_2e or about 24 tonnes of CO_2e per year per person.[1142] Over 80 percent of the GHG emissions in the US are comprised of CO_2 emissions from energy related fossil fuel combustion. In 2004, California emitted 0.492 billion tonnes of CO_2e, or about 7 percent of the US emissions.[1143] If California were a country, it would be the 16th largest emitter of GHGs in the world.[1144] This large number is due primarily to the sheer size of California. Compared to other states, California has one of the lowest per capita GHG emission rates in the country. This is due to California's higher energy efficiency standards, its temperate climate, and the fact that it relies on substantial out-of-state energy generation.

In 2004, 81 percent of greenhouse gas emissions (in CO_2e) from California were comprised of CO_2 emissions from fossil fuel combustion, with 4 percent comprised of CO_2 from process emissions. CH_4 and N_2O accounted for 5.7 percent and 6.8 percent of total CO_2e respectively, and high GWP gases[1145] accounted for 2.9 percent of the CO_2e emissions. Transportation is the largest end-use category of GHG emissions. Transportation includes that used for industry (i.e., shipping) as well as residential use.

In 2007, 102.6 million metric tonnes of CO_2-equivalent ($MMTCO_2e$) greenhouse gases were emitted by the San Francisco Bay Area (95.5 $MMTCO_2e$ were emitted within the Bay Area Air District and 7.1 $MMTCO_2e$ were indirect emissions from imported electricity).[1146] Transportation sources (e.g. fossil fuel combustion) were associated with 41 percent of the total emissions, industrial/commercial 34 percent,

[1140] EPA, 2008. *Climate Change – Health and Environmental Effects.* http://www.epa.gov/climatechange/effects/health.html#climate (accessed January 3, 2009).
[1141] Sum of Annex I and Annex II countries without counting Land-Use, Land-Use Change and Forestry (LULUCF) http://unfccc.int/ghg_emissions_data/predefined_queries/items/3814.php For countries for which 2004 data was unavailable, the most recent year was used.
[1142] 2006 Inventory of US Greenhouse Gas Emissions and Sinks. http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR6MBLP4/$File/06ES.pdf.
[1143] California Air Resources Board. Note that 2004 is typically the most recent inventory year presented by the ARB; as such, USA- and world-wide emissions from 2004 are presented here to keep the comparison years the same.
[1144] Anywhere between the 12th and 16th depending upon methodology. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. California Energy Commission.
[1145] Such as HFCs and PFCs.
[1146] In February 2010, BAAQMD revised their 2007 GHG emission inventory to 95.8 $MMTCO_2e$. This reduction in emissions is attributable to decreased emissions assigned to ships and boats under the transportation category.

domestic 7 percent, power plants 15 percent, and off-road equipment 3 percent. In 1990, San Francisco's total GHG emissions were approximately 8.3 million metric tonnes CO_2e.

III.S.3 Regulatory Framework

Climate change has only recently been widely recognized as a threat to the global climate, economy, and population. As a result, the climate change regulatory setting—federal, state, and local—is complex and evolving. This section identifies key legislation, executive orders, and seminal court cases related to climate change germane to Project GHG emissions.

Federal

Currently, there is no federal legislation requiring reductions in GHG emissions. Rather, the United States Environmental Protection Agency (USEPA) administers a variety of voluntary programs and partnerships with GHG emitters in which the USEPA partners with industries producing and utilizing synthetic GHGs to reduce emissions of these particularly potent GHGs. There are federal actions requiring increasing automobile efficiency, an endangerment finding for CO_2, and a recently finalized regulation requiring large sources of GHG emissions to report their emission to the USEPA. In addition, there are several bills pending in Congress that are attempting to regulate GHG emissions in the United States; most of these bills require a cap and trade program where GHG emissions would be reduced overall through a market-driven approach.

April 2007 Supreme Court Ruling

In *Massachusetts et al. vs. Environmental Protection Agency et al.* (April 2, 2007) the US Supreme Court ruled that the *Clean Air Act* (CAA) authorizes the USEPA to regulate CO_2 emissions from new motor vehicles. The Court did not mandate that the USEPA enact regulations to reduce GHG emissions, but found that the only instances where the USEPA could avoid taking action if it were found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change. On April 24, 2009 the USEPA issued a proposed endangerment finding, stating that high atmospheric levels of greenhouse gases "are the unambiguous result of human emissions, and are very likely the cause of the observed increase in average temperatures and other climatic changes." The USEPA further found that "atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the CAA." The finding itself does not impose any requirements on industry or other entities. The public comment period for this proposed endangerment finding ended June 23, 2009, and the finding is now under final review.[1147]

Corporate Average Fuel Efficiency Standards

In response to the *Massachusetts et al. vs. Environmental Protection Agency et al.* ruling, the Bush Administration issued an executive order on May 14, 2007, directing the USEPA and Departments of Transportation (DOT) and Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. On December 19, 2007, the *Energy Independence and Security Act of 2007* (EISA) (discussed below) was signed into law, which requires an increased Corporate Average Fuel Economy (CAFE) standard of 35 miles per gallon for the combined fleet of cars and light trucks by

[1147] Available at http://www.epa.gov/climatechange/endangerment.html.

model year 2020. EISA requires establishment of interim standards (from 2011 to 2020) that would be the "maximum feasible average fuel economy" for each fleet. On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for model years 2011 to 2015 passenger cars and light trucks. NHTSA issued a final rule for model year 2011 on March 23, 2009.[1148]

On May 19, 2009, President Obama announced a national policy for fuel efficiency and emissions standards in the US auto industry. The proposed rulemaking is a collaboration between the DOT and USEPA with the support of the United Auto Workers. The proposed federal standards apply to passenger cars, light-duty trucks, and medium duty passenger vehicles built in model years 2012 through 2016. If finalized, the proposed rule would surpass the 2007 CAFE standards and require an average fuel economy standard of 35.5 mpg in 2016. On May 22, 2009, the DOT and USEPA issued a notice of upcoming joint rulemaking on this issue.[1149,1150] A Draft Environmental Impact Statement has been issued and the comment period for this ends on November 9, 2009. On June 30, 2009, the USEPA granted the waiver to California for its greenhouse gas emission standards for motor vehicles; this is described in more detail below.

Energy Independence and Security Act of 2007

In addition to setting increased CAFE standards for motor vehicles, the EISA includes other provisions:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Section 301–325)
- Building Energy Efficiency (Sections 411–441)

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

Consolidated Appropriations Act of 2008 (HR 2764)

Congress passed the *Consolidated Appropriations Act of 2008* (HR 2764) in December 2007, which includes provisions requiring the establishment of mandatory GHG reporting requirements. The measure directed USEPA to publish draft rules by September 2008, and final rules by June 2009 mandating reporting "for all sectors of the economy." The USEPA finalized GHG reporting rules on September 22, 2009. The GHG reporting rule requires reporting of GHG emissions from facilities that emit 25,000 metric tonnes or more per year of GHG emissions and these are required to submit annual reports to EPA.

Congressional Bills

There are several pieces of proposed legislation in both the United States Senate and House of Representatives. While these pieces are not yet final enacted regulations, they are key pieces that could have an impact on GHG emission reductions. The *American Clean Energy and Security Act of 2009*, known as the Waxman-Markey Bill is an energy bill that would establish a cap-and-trade plan for GHG emission

[1148] http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/.
[1149] http://yosemite.epa.gov/opa/admpress.nsf/6fa790d452bcd7f58525750100565efa/.
451902cb77d4add5852575bb006d3f9b!OpenDocument.
[1150] http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/.

reductions of 17 percent by 2020 to address climate change and 80 percent reduction by 2050. It also includes a 20 percent renewable energy source and efficiency requirement for utilities by 2020. This bill was passed by the House of Representatives on June 26, 2009. The bill needs to be voted on in the Senate.

The Senate is working on a companion bill, which was referred to the Senate Environment and Public Works committee for consideration. This bill is the *Clean Energy Jobs and American Power Act* known as the Kerry-Boxer bill. This bill calls for a 20 percent reduction in GHG emissions by 2020 and greater than 80 percent reductions by 2050. This is higher than the Waxman-Markey bill passed in the House of Representatives.

State

California has enacted a variety of legislation that relates to climate change, much of which sets aggressive goals for GHG reductions within the state. However, none of this legislation provides definitive direction regarding the treatment of climate change in environmental review documents prepared under CEQA. As discussed below, the Office of Planning and Research (OPR) has been directed to develop CEQA Guidelines for the mitigation of GHG emissions and their effects; ARB must adopt regulations by January 1, 2010. OPR recently released a guidance document, discussed below, for analyzing GHG emissions under CEQA, but this document is purely advisory and serves as guidance only. On January 8, 2009, OPR released Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas Emissions. These amendments propose specific guidelines to public agencies for addressing GHG emissions as part of the general CEQA requirements to determine a project's effects on the environment. In addition, on October 24, 2008, ARB released a draft staff proposal entitled "Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the *California Environmental Quality Act*" (Draft ARB Thresholds). More detail was provided in another document released on December 9, 2008. However, the process of developing statewide guidance has been halted by the ARB. Because this process was halted, with no intention of continuing, it would not be further discussed in this section. On April 13, 2009, OPR submitted proposed amendments to the CEQA Guidelines for greenhouse gas emissions to the Secretary for Natural Resources.[1151,1152,1153] On July 3, 2009, the CRA commenced the *Administrative Procedure Act* rulemaking process for certifying and adopting these amendments. Public comments were accepted through August 20, 2009.

No relevant local, state, or regional agency has promulgated binding regulations for analyzing GHG emissions, determining their significance, or mitigating any significant effects in CEQA documents for residential and commercial developments. The discussion below provides a brief overview of the ARB and OPR documents and of the primary legislation that relates to climate change, which may affect the emissions associated with the Project.

Assembly Bill 32 (Statewide GHG Reductions)

The *California Global Warming Solutions Act of 2006*, widely known as AB 32, requires ARB to develop and enforce regulations for the reporting and verification of statewide greenhouse gas emissions. ARB is directed to set a greenhouse gas emission limit, based on 1990 levels, to be achieved by 2020. The bill sets a timeline for adopting a scoping plan for achieving greenhouse gas reductions in a technologically and economically feasible manner.

[1151] http://opr.ca.gov/index.php?a=ceqa/index.html.
[1152] http://ceres.ca.gov/ceqa/guidelines/.
[1153] http://www.arb.ca.gov/cc/localgov/ceqa/ceqa.htm.

The heart of the bill is the requirement that statewide GHG emissions must be reduced to 1990 levels by 2020. California needs to reduce GHG emissions by approximately 29 percent below business-as-usual predictions of year 2020 GHG emissions to achieve this goal. The bill requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. Key AB 32 milestones include:

- June 30, 2007—Identification of discrete early action greenhouse gas emissions reduction measures. On June 21, 2007, ARB satisfied this requirement by approving three early action measures. These were later supplemented by adding six other discrete early action measures.
- January 1, 2008—Identification of the 1990 baseline GHG emissions level and approval of a statewide limit equivalent to that level. Adoption of reporting and verification requirements concerning GHG emissions. On December 6, 2007, ARB approved a statewide limit on GHG emissions levels for the year 2020 consistent with the determined 1990 baseline.
- January 1, 2009—Adoption of a scoping plan for achieving GHG emission reductions. On October 15, 2008, ARB issued a "discussion draft" Scoping Plan entitled "Climate Change Draft Scoping Plan: A Framework for Change" (Draft Scoping Plan). ARB adopted the Draft Scoping Plan at its December 11, 2008 meeting.
- January 1, 2010—Adoption and enforcement of regulations to implement the "discrete" actions.
- January 1, 2011—Adoption of GHG emissions limits and reduction measures by regulation.
- January 1, 2012—GHG emissions limits and reduction measures adopted in 2011 become enforceable.

Executive Order S-3-05 (Statewide GHG Targets)

California Executive Order S-03-05 (June 1, 2005) mandates a reduction of GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Although the 2020 target is the core of AB 32, and has effectively been incorporated into AB 32, the 2050 target remains the goal of the Executive Order.

Low Carbon Fuel Standard (LCFS)

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by ARB. ARB identified the LCFS as a Discrete Early Action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009.[1154]

Senate Bill 1368 (GHG Emissions Standard for Baseload Generation)

Senate Bill (SB) 1368 prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out of state as well as in state, and to publicly owned as well as investor-owned electric utilities.

[1154] http://www.arb.ca.gov/fuels/lcfs/lcfs.htm.

Assembly Bill 1493 (Mobile Source Reductions)

AB 1493 requires ARB to adopt regulations by January 1, 2005, to reduce GHG emissions from noncommercial passenger vehicles and light-duty trucks of model year 2009 and thereafter. The bill requires the CCAR to develop and adopt protocols for the reporting and certification of greenhouse gas emissions reductions from mobile sources for use by ARB in granting emission reduction credits. The bill authorizes ARB to grant emission reduction credits for reductions of greenhouse gas emissions prior to the date of enforcement of regulations, using model year 2000 as the baseline for reduction.

In 2004, ARB applied to the USEPA for a waiver under the federal CAA to authorize implementation of these regulations. The waiver request was formally denied by the USEPA in December 2007 after California filed suit to prompt federal action. In January 2008 the State Attorney General filed a new lawsuit against the USEPA for denying California's request for a waiver to regulate and limit GHG emissions from these automobiles. In January 2009, President Barack Obama issued a directive to the USEPA to reconsider California's request for a waiver. On June 30, 2009 the USEPA granted the waiver for California for its greenhouse gas emission standards for motor vehicles. As part of this waiver, USEPA specified the following provision: ARB may not hold a manufacturer liable or responsible for any noncompliance caused by emission debits generated by a manufacturer for the 2009 model year. California has agreed to cooperate with the federal CAFE and GHG emission reductions in order for there to be one national standard.

Senate Bills 1078 and 107 (Renewables Portfolio Standard)

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California's RPS requires retail suppliers of electric services to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010.

Executive Order S-14-08 and S-21-09 (Renewables Portfolio Standard)

California Executive Order S-14-08 (November 11, 2008) mandates retail suppliers of electric services to increase procurement from eligible renewable energy resources to 33 percent by 2020. This has been reiterated by California Executive Order S-21-09 which charges ARB by July 31, 2010 to establish a regulation consistent with this 33 percent target by 2020. This is a further increase in RPS over SB 1078 and SB 107.

Senate Bill 375 (Land Use Planning)

SB 375 provides for a new planning process to coordinate land use planning and regional transportation plans and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs) relevant to the Project site (including the Metropolitan Transportation Commission (MTC)), to incorporate a "sustainable communities strategy" in their regional transportation plans (RTPs) that would achieve GHG emission reduction targets set by ARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. SB 375 would be implemented over the next several years.

SB 375 is similar to the Regional Blueprint Planning Program, established by the California Department of Transit, which provides discretionary grants to fund regional transportation and land use plans voluntarily developed by MPOs working in cooperation with Councils of Government. MTC's 2013 RTP would be

its first plan subject to SB 375. The Scoping Plan adopted by ARB in December of 2008 relies on the requirements of SB 375 to implement the carbon emission reductions anticipated from land use decisions. The Regional Targets Advisory Committee (RTAC) established by SB 375 recently provided its recommendations to ARB.

Energy Conservation Standards

Energy Conservation Standards for new residential and non-residential buildings were first adopted by California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6 of the *California Code of Regulations* [CCR]).[1155] In general, Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608), dated December 2006, were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. While these regulations are now often seen as "business as usual," they do exceed the standards imposed by any other state and reduce GHG emissions by reducing energy demand.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The *California Green Building Standards Code* (proposed Part 11, Title 24) was adopted as part of the *California Building Standards Code* (Title 24, CCR). Part 11 establishes voluntary standards, which would become mandatory in the 2010 edition of the Code, on planning and design for sustainable site development, energy efficiency (in excess of the *California Energy Code* requirements), water conservation, material conservation, and internal air contaminants.

Office of Planning and Research Advisory on CEQA and Climate Change

In June 2008, the OPR published a technical advisory entitled *CEQA and Climate Change: Addressing Climate Change Through CEQA* (OPR Advisory). This guidance, which is purely advisory, proposes a three-step analysis of GHG emissions:

1. **Mandatory Quantification of GHG Project Emissions.** The environmental impact analysis must include quantitative estimates of a project's GHG emissions from different types of air emission sources. These estimates should include both construction-phase emissions, as well as completed operational emissions, using one of a variety of available modeling tools.
2. **Assessment of "Significance" of Project-Specific GHG Emissions.** Each EIR document should assess the significance of the project's impacts on climate change. The OPR Advisory recognizes uncertainty regarding what GHG impacts should be determined to be significant and encourages agencies to rely on the evolving guidance being developed in this area. According to the OPR Advisory, the environmental analysis should describe a "baseline" of existing (pre-project) environmental conditions, and then add project GHG emissions on to this baseline to evaluate whether impacts are significant.

[1155] Although new building energy efficiency standards were adopted in April 2008, these standards do not go into effect until January 1, 2010. Thus, the 2005 standards that went into effect on October 1, 2005 remain the current Title 24 standards.

3. **Mitigation Measures.** According to the OPR Advisory, "all feasible" mitigation measures or project alternatives should be adopted if an impact is significant, defining feasibility in relation to scientific, technical, and economic factors. If mitigation measures cannot sufficiently reduce project impacts, the agency should adopt whatever measures are feasible and include a fact-based statement of overriding considerations explaining why additional mitigation is not feasible. OPR also identifies a menu of GHG emissions mitigation measures, ranging from balanced "mixed-use" master-planned project designs to construction equipment and material selection criteria and practices.

In addition to this three-step process, the OPR Advisory contains more general policy-level guidance. It encourages agencies to develop standard GHG emissions reduction and mitigation measures. The OPR Advisory directs ARB to recommend a method for setting the GHG emissions threshold of significance, including both qualitative and quantitative options.

Senate Bill 97 (CEQA Guidelines)

SB 97 requires that OPR prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by CEQA. The Resources Agency is required to certify and adopt these revisions to the CEQA Guidelines by January 1, 2010. The Guidelines would apply retroactively to any incomplete environmental impact report, negative declaration, mitigated negative declaration, or other related document.[1156]

The CRA received recommended Amendments to the CEQA Guidelines for greenhouse gas emissions from the Governor's Office of Planning and Research on April 13, 2009. On July 3, 2009, the CRA commenced the *Administrative Procedure Act* rulemaking process for certifying and adopting these amendments pursuant to *Public Resources Code* Section 21083.05. During the process, CRA would hold public hearings, receive oral comments, consider both written and oral comments, and publish the final rule, which would take into consideration comments made.

The January 8, 2009, Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas Emissions state that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment:

- Extent the project helps or hinders the goals of AB 32
- Extent project may increase consumption of fuel and energy resources
- Extent project impacts or emissions exceed any threshold of significance

No specific methodologies for performing an assessment are indicated, but rather it is left to the lead agency to determine the appropriate methodologies in context of a particular project.

The proposed amendments indicate that lead agencies should consider all feasible means of mitigating greenhouse gas emissions that substantially reduce energy consumption or GHG emissions. These potential mitigation measures may include carbon sequestration (i.e., long-term storage of carbon dioxide or other forms of carbon). If off-site or carbon-offset mitigation measures are proposed they must be part

[1156] Senate Bill No. 97. CHAPTER 185. An act to add Section 21083.05 to, and to add and repeal Section 21097 of, the Public Resources Code, relating to the California Environmental Quality Act. http://www.opr.ca.gov/ceqa/pdfs/SB_97_bill_20070824_chaptered.pdf.

of reasonable plan of mitigation that the agency itself is committed to implementing. No threshold of significance or any specific mitigation measures are indicated.

Regional

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for comprehensive air pollution control in the entire San Francisco Bay Area Air Basin. Currently, BAAQMD does not have an adopted or recommended threshold of significance for GHG emissions. However, BAAQMD is in the process of updating its CEQA Guidelines, which includes the development of recommended significance thresholds, assessment methodologies, and mitigation strategies for GHG emissions. The draft approach that BAAQMD is considering in their September 2009 document entitled *California Environmental Quality Act Draft Air Quality Guidelines* includes GHG thresholds for land-use development projects. BAAQMD presents three different criteria that could be used for determining significance of mixed-use development's operational GHG emissions. One option would include a numeric "bright line" threshold of 1,100 metric tonnes CO_2e per year for operational emission sources including residential and non-residential building energy use, mobile source emissions, area source emissions, and indirect emissions associated with water usage. The second option is a metric based on the service population (the residential population plus the number of jobs associated with the land-uses). This metric is 4.6 tonnes per service population per year for operational emissions. The third option is compliance with a qualified Climate Action Plan that includes enforceable measures to reduce GHG emissions consistent with AB 32 goals or Executive Order S-03-05 targets. The BAAQMD expects to adopt new thresholds of significance later this year. In October 2009, BAAQMD posted updates to the staff-recommended CEQA thresholds of significance, which eliminate any climate change thresholds of significance criteria for construction emissions.[1157] Therefore, these are not discussed.

Local

In February 2002, the San Francisco Board of Supervisors passed the Greenhouse Gas Emissions Reduction Resolution (Resolution 158-02) committing the City to a GHG emissions reduction goal of 20 percent below 1990 levels by the year 2012. The resolution also directs the San Francisco Department of the Environment, the San Francisco Public Utilities Commission (SFPUC), and other appropriate City agencies are required to complete a GHG emission reduction action plan. In September 2004, the San Francisco Department of the Environment and the SFPUC published the Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Emissions (Plan). Although the San Francisco Board of Supervisors has not formally committed the City to perform the actions addressed in the Plan, and many of the actions require development and commitment of resources, it is a blueprint for GHG emission reductions, and several of the actions are now in progress.

The Plan presents estimates of San Francisco's baseline GHG inventory and reduction targets. It states that burning fossil fuels in vehicles and for energy use in buildings and facilities is the major contributor to

[1157] Available at http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Staff-Recommended%20and%20Existing%20CEQA%20Thresholds%20Table%2010-07-09.ashx.

San Francisco's GHG emissions; in 1990, burning fossil fuels for these purposes produced approximately 8.3 million metric tonnes of CO_2. The Plan also describes recommended emissions reduction actions in the key target sectors: transportation, energy efficiency, renewable energy, and solid waste management to meet stated goals by 2012.

The Plan presents proposals to reduce annual CO_2 emissions by 2.5 million tons by 2012, a 20 percent reduction below 1990 emissions, including greening vehicle fleets; increasing energy efficiency in public and private buildings; developing renewable energy technologies like solar, wind, fuel cells, and tidal power; and expanding residential and commercial recycling programs. The roadmap to achieving these goals requires the cooperation of a number of City, regional, and state agencies as well as private sector partners. The City is already implementing a wide range of actions (e.g., transportation, solar, and energy efficiency) to reduce GHG emissions.

Greenhouse Gas Reduction Ordinance

In May 2008, the City adopted an ordinance amending the *Environment Code* to establish GHG emission targets and action plans, to authorize the Department of the Environment to coordinate efforts to meet these targets, and to make environmental findings. The ordinance establishes the following GHG emission reduction limits and target dates for San Francisco:

- Determine 1990 City GHG emissions by 2008 (baseline level with reference to which target reduction are set)
- Reduce GHG emissions by 25 percent below 1990 levels by 2017
- Reduce GHG emission by 40 percent below 1990 levels by 2025
- Reduce GHG emissions by 80 percent below 1990 levels by 2050

The ordinance also requires City departments to prepare Climate Action Plans that assess and report GHG emissions and to prepare recommendations to reduce emissions. The San Francisco Planning Department is also required to (1) update and amend the City's applicable General Plan elements to include the emissions reduction limits set forth in the GHG reduction ordinance and policies to achieve those targets; (2) consider a project's impact on the City's GHG reduction limits as part of its review under CEQA; and (3) work with other City department to enhance the "transit first" policy to encourage a shift to sustainable modes of transportation, thereby reducing emissions and helping to achieve the targets set forth by the ordinance.

Green Building Code

On August 5, 2008, the City adopted the *San Francisco Building Code* (SFBC), Chapter 13C, "green building codes" for new construction and for renovations of existing structures, consistent with the GHG reduction measures in the SFCAP. The new green building standards in SFBC Chapter 13C are to be phased in by 2012. At 2012, the ordinance specifically requires newly constructed commercial buildings over 5,000 square feet (sf) to be subject to Leadership in Energy and Environmental Design (LEED®) Gold, residential buildings over 75 feet in height to be LEED® certified or an equivalent standard, and other residential buildings to be subject to GreenPoint Rated to 75 points, which makes San Francisco the city with the most stringent green building requirements in the nation. The ordinance identifies cumulative benefits through the year 2012 which include reducing CO_2 emissions by 60,000 tons, saving 220,000 megawatt hours of power, saving 100 million gallons of drinking water, reducing waste and storm water

by 90 million gallons of water, reducing construction and demolition waste by 700 million pounds, increasing the valuations of recycled materials by $200 million, reducing automobile trips by 540,000, and increasing green power generation by 37,000 megawatt hours.

New projects would be evaluated on a point system with credit given for materials used in the building, the location of the building site and water and energy efficiencies. The new codes focus on water and energy conservation, recycling and reduction of carbon emissions. They apply to most buildings in the City, including residential projects of all sizes, new commercial buildings, and renovations of large commercial spaces. Large residential and commercial buildings would be evaluated under the LEED® rating system. Medium and small residential construction would use the GreenPoint rating system, which is less stringent.

Transit First Policy

In 1973, San Francisco instituted the Transit First Policy, which added Section 16.102 to the City Charter with the goal of reducing the City's reliance on freeways and meeting transportation needs by emphasizing mass transportation. The Transit First Policy gives priority to public transit investments; adopts street capacity and parking policies to discourage increased automobile traffic; and encourages the use of transit, bicycling and walking rather than use of single-occupant vehicles. Subsequent updates to the Planning Code have enhanced this commitment with provisions that have requirements to encourage the use of transit, walking and bicycling while discouraging driving. Some of these include required bicycle parking, required spaces for shared car services, shower facilities and lockers in commercial and industrial buildings, separation of parking costs from housing costs in new residential buildings, and transportation management programs.

In 2007, voters in San Francisco passed Proposition A, which requires a reduction of GHG emissions on the order of 20 percent, specific to the transportation sector. As part of this the San Francisco Municipal Transportation Authority (SFMTA) is developing a Climate Action Plan to meet the goals of this Proposition.

San Francisco has also recently adopted a Bicycle Plan that aims to encourage and increase the number of bicycle trips made in the city by further enhancing the bicycle network and adopting bicycle friendly policies.

San Francisco adopted a commuter benefits ordinance that requires all employers in San Francisco that have 20 or more employees to offer a commuter benefits program.

San Francisco Sustainability Plan

In 1993, the San Francisco Board of Supervisors established the Commission on San Francisco's Environment, charged with, among other things, drafting and implementing a plan for San Francisco's long-term environmental sustainability. The notion of sustainability is based on the United Nations definition that "a sustainable society meets the needs of the present without sacrificing the ability of future generations and non-human forms of life to meet their own needs." The Sustainability Plan for the City of San Francisco was a result of community collaboration with the intent of establishing sustainable development as a fundamental goal of municipal public policy.

The Sustainability Plan is divided into 15 topic areas, 10 that address specific environmental issues (air quality; biodiversity; energy, climate change and ozone depletion; food and agriculture; hazardous materials; human health; parks, open spaces, and streetscapes; solid waste; transportation; and water and wastewater), and five that are broader in scope and cover many issues (economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management). Additionally, the Sustainability Plan contains indicators designed to create a base of objective information on local conditions and to illustrate trends toward or away from sustainability. Although the Sustainability Plan became official City policy in July 1997, the Board of Supervisors has not committed the City to perform all of the actions addressed in the plan. The Sustainability Plan serves as a blueprint, with many of its individual proposals requiring further development and public comment.

The Electricity Resource Plan (Revised December 2002)

San Francisco adopted the Electricity Resource Plan to help address growing environmental health concerns in San Francisco's southeast community, home of two power plants. The plan presents a framework for assuring a reliable, affordable, and renewable source of energy for the future of San Francisco.

San Francisco Municipal Transportation Agency's Zero Emissions 2020 Plan

The SFMTA's Zero Emissions 2020 plan focuses on the purchase of cleaner transit buses including hybrid diesel-electric buses. Under this plan hybrid buses would replace the oldest diesel buses, some dating back to 1988. The hybrid buses emit 95 percent less particle matter (PM, or soot) than the buses they replace, the produce 40 percent less oxides of nitrogen (NO_X), and they reduce greenhouse gases by 30 percent.

LEED® Silver for Municipal Buildings

In 2004, the City amended Chapter 7 of the *San Francisco Environment Code*, requiring all new municipal construction and major renovation projects to achieve LEED® Silver Certification from the US Green Building Council.

Zero Waste

In 2004, the City committed to a goal of diverting 75 percent of its waste from landfills by 2010, with the ultimate goal of zero waste by 2020. San Francisco currently recovers 72 percent of discarded material.[1158] In 2009, the City added Chapter 19 to its *Environment Code*, which outlines the City's mandatory recycling and composting program. All people are required to separate their waste into recyclables, compostables, and trash; and all property managers, food vendors, and refuse collectors are required to supply appropriately designed containers so that refuse can be easily be separated.

Construction and Demolition Debris Recovery Ordinance

In 2006, the City adopted Ordinance No. 27-06, requiring all construction and demolition debris to be transported to a registered facility that can divert a minimum of 65 percent of the material from landfills. This ordinance applies to all construction, demolition, and remodeling projects within the City.

[1158] San Francisco Department of the Environment Zero Waste program overview: http://www.sfenvironment.org/our_programs/overview.html?ssi=3.

In August 2008, Mayor Gavin Newsom signed into law San Francisco's Green Building Ordinance (codified as Chapter 13C of the SFBC) for newly constructed residential and commercial buildings and renovations to existing buildings. The City's Green Building Ordinance includes a requirement to redirect at least 75 percent of construction and demolition waste from landfills.

GoSolarSF

In 2008, the San Francisco Public Utilities Commission (SFPUC) launched the "GoSolarSF" program to San Francisco's businesses and residents, offering incentives in the form of a rebate program that could pay for approximately half the cost of installation of a solar power system, and more to those qualifying as low-income residents.

The Planning Department and Department of Building Inspection have also developed a streamlining process for Solar Photovoltaic Permits and priority permitting mechanisms for projects pursuing LEED® Gold Certification.

Other Local Ordinances

San Francisco has implemented several planning and zoning ordinances that address land use related GHG emissions. Some of these ordinances enhance neighborhood-serving retail, preserve and enhance the City's supply of affordable housing, and ensure that commuter traffic does not impede Muni transit service or overburden streets and parking. The City has a ban on non-approved wood burning fireplaces. The City has a transit impact development fee that applies to many new land-use development projects to offset the impact on the transportation system. For water efficiency measures the City has several ordinances including limitations on water use for landscaping in new developments.

III.S.4 GHG Emissions Inventory

Inventory Method

Project-generated GHG emissions were developed based on methodologies and emission factors recommended by CCAR, IPCC, and other government agencies to determine whether project implementation would conflict with the state goal of reducing GHG emissions in California to 1990 levels by 2020 (i.e., whether project GHG emissions would result in a substantial contribution to global climate change), as set forth by the timetable established in AB 32 or with San Francisco's Climate Action Plan[1159] such that the project would impede implementation of the local GHG reduction goals established by the 2008 Greenhouse Gas Reduction Ordinance.[1160] Project-specific information was used to determine the total GHG emissions. In addition, energy usage studies specific to the anticipated building uses were used.

[1159] San Francisco Department of Environment. 2004. *Climate Action Plan for San Francisco.* http://www.sfenvironment.org/downloads/library/climateactionplan.pdf.
[1160] *San Francisco Municipal Code*, California Chapter 9 Greenhouse Gas Emissions Targets and Departmental Action Plans. http://www.municode.com/library/HTML/14134/ch009.html.

The methods used in this EIR apply local emission factors for the carbon intensity of electricity which are those recommended by the CCAR to be used in GHG emission inventories.[1161]

The Project consists of the construction and occupancy of the Project site. Project GHG emissions were calculated using guidance from the CCAR and IPCC. The GHG emissions inventory relied on scientific studies and studies conducted by government agencies that provide data on energy use patterns associated with building energy use, municipal activities, natural resources distribution, and other activities that would take place as part of the Project . The GHG emission inventory was developed using several models to estimate GHG emissions from the Project. These include the OFFROAD 2007 model, EMFAC model, and the URBEMIS model.

A GHG inventory was prepared for the Project by ENVIRON International Corporation (ENVIRON) to identify both the one-time emissions and annual emissions that are expected to occur each year after build-out of the Project. The following analysis is a summary of this report.[1162]

This inventory was prepared as a "worst-case" analysis. For example, it assumes that all emissions from the Project would be "new," in the sense that, absent the development of the Project, these emissions would not occur. Given the global nature of GHG emissions, "new" global GHG emissions are those caused by economic growth and population growth (births); local development projects accommodate such growth.

As an example of why these are worst-case emissions, these emissions are estimated assuming that there would be no reductions in GHG-generating activities over time. This would be unlikely, and presents a conservative analysis, given the expected reductions in GHG emissions from most activities that would take place over the years due to future regulations, greater public awareness, and the likely increasing costs of energy.

At the entitlement stage of a development, while the number of homes, the approximate size of commercial areas, and the locations of both are known, the exact designs of the homes, businesses, and facilities are not. The types of buildings and the types of facilities at the future project site can be used for developing an estimate of the project's anticipated GHG emissions. Energy used in a building depends in part on the built environment; however, actual future emissions from the site would depend heavily upon the future homeowners' and business owners' habits. Because the actual future occupants and their habits are not yet known, average current behavior is assumed. That assumption is likely to be a "worst-case" assumption. Given the current regulatory environment and the media focus on global climate change, it is likely that the actual future occupants would be more sensitive to the GHG emissions caused by their activities and, therefore, their activities would result in lower GHG emissions than average current behavior shows.

The GHG emissions inventory includes some aspects that are fully within the control of the project, such as grading and the placement of utilities; some aspects that are in control of the individuals building the houses and commercial buildings, such as construction emissions; and some aspects for which control over

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[1161] The CCAR General Reporting Protocol version 3.1 states on p. 34, "If your electricity provider reports an electricity delivery metric under the California Registry's Power/Utility Protocol, you may use this factor to determine your emissions, as it is more accurate than the default regional factor."
http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf.

[1162] ENVIRON International Corporation. 2009. *Climate Change Technical Report Candlestick Point–Hunters Point Shipyard Phase II Development Plan*. October (Appendix S to this EIR).

emissions is shared by the developers and the residents, such as energy use in the built environment and emissions from traffic by the development's future residents and employees in the commercial areas.

The timeframe over which GHGs are emitted varies from category to category, which is taken into consideration in the emissions inventory. For most of the categories, GHGs would be emitted every year that the development is inhabited. For these categories (residential buildings, nonresidential buildings, mobile sources, municipal services, and area sources), the inventory includes estimates of annual GHG emissions from ongoing operations associated with the Project. GHG emissions from two of the categories, construction and changes in vegetation sequestration, are one-time events that would not be part of the Project's ongoing activity. These one-time emissions can be divided by the estimated lifetime of the Project to allow direct comparison of these two emissions classes. The inventory presents estimates of these one-time emissions, converts them to annualized estimates, and integrates them into an annual inventory.

Conceptual Design Features

The GHG emission inventory assumed the incorporation of several conceptual design features in its analysis. These conceptual design features are part of the Project. However, since there could be modifications during the entitlement and development process, these have been incorporated as mitigation measures to ensure that the Project would not be redesigned to omit these critical features. There has been no analysis of the GHG emissions without these conceptual design features. The conceptual design features are listed below and further discussed in the GHG emission inventory for individual source categories.

Project Design Features Whose Emissions Reductions Were Incorporated into the Analysis

- Provide neighborhood-serving retail.
- Provide automobile, public transportation, and pedestrian connections between the Shipyard, Candlestick Point, and the larger Bayview neighborhood.
- The urban design of the Project would reduce its footprint and allow for transportation and open space corridors.
- Integrate land use patterns with multimodal street networks that would facilitate walking and cycling for internal trips and transit for trips of greater distance.
- Extend existing Muni routes to better serve the Project site and area; increase frequencies on existing routes to provide more capacity; and complement those existing routes with new transit facilities and routes that would serve the Project's proposed land use program and transit demand.
- The Project is a redevelopment project and would not result in the conversion of any new land to settlement.
- Plant up to 10,000 trees net new trees at the Project site and in the community.
- Exceed the 2008 Standards for Title 24 Part 6 energy efficiency standards for homes and businesses by at least 15 percent.
- Install ENERGY STAR[1163] appliances, where appliances are offered by homebuilders.
- Use energy efficient street lighting.

[1163] The term ENERGY STAR is capitalized as is the convention used by the United States Environmental Protection Agency and Department of Energy.

Project Design Features Whose Emissions Reductions Were Not Incorporated into the Analysis but Could Yield Further GHG Emissions Savings

- Transportation Demand Management Plan to reduce the auto use and encourage residents, employees and visitors to use alternative modes of travel, such as transit, walking, and bicycling.
- The energy savings resulting from the replacement of 256 older homes with new more energy efficient homes.
- The Project would provide a network of reclaimed-water mains for dual plumbing in commercial buildings and for irrigation of landscaped areas. Reclaimed water mains would distribute reclaimed water when and if the City develops a reclaimed source of water.

Standard Conditions

The Project would follow all applicable regulations and ordinances in existence at the time of Project construction. The follow rules and regulations are currently in existence and would be followed:

- Non-approved types of wood-burning stoves and fireplaces are prohibited.
- Residential and non-residential buildings must follow the *Green Building Code*.

GHG Emission Inventory

Short-Term (One-Time) Impacts

Short-term or one-time emissions from the development of this Project are associated with vegetation removal and re-vegetation on the Project site and construction-related activities. Construction activities also include a life-cycle analysis estimating the GHG associated with the manufacture and transport of building materials and infrastructure. As previously mentioned, this estimate for life-cycle emissions is used for comparison purposes only and is not included in the final inventory as these emissions would be accounted for under AB 32 in other industry sectors.

Vegetation Sequestration Change

The Project site is located on land classified as settlement as classified by the IPCC publication Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines). There would be no changes in the land use classification. The overall CO_2 emissions due to vegetation change would result from the amount that can be expected to be sequestered by new plantings. The Project would plant approximately 10,000 net new trees at the Project site and in the community. These trees would sequester approximately 7,000 metric tonnes CO_2. This is based on an average tree sequestration rate of 0.035 tonne CO_2 per year per tree for 20 years of growth. Thus, the net CO_2 emission would be -7,000 tonnes CO_2e. These trees would continue to sequester carbon after 20 years, although at a slower rate and is typically offset by losses from clipping, pruning, and occasional death.

Construction-Related Activities

CO_2 emissions associated with different aspects of urban development can be estimated using a combination of software programs. The OFFROAD2007[1164] and the EMFAC2007[1165] models are used to generate emission factor data for construction equipment and motor vehicles, respectively. These values serve as inputs for the URBEMIS[1166] model, which estimates emissions from several different aspects of urban development including from construction sources based on emission factors and information specific to the Project.

Assumptions regarding construction timing and the number, type, and operating hours of equipment are based on the number and type of equipment that would be used in the construction of the Project, as well as the duration of the different construction phases[1167]. These assumptions are used with CO_2 specific emission factors compiled in OFFROAD 2007 and EMFAC2007. The URBEMIS model estimate does not analyze emissions from construction related electricity or natural gas consumption. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors that make them too speculative to quantify. In addition, this is typically a relatively small contribution to GHG emissions during construction.

Table III.S-2 (Project Construction GHG Emissions) summarizes the output results from Table 3-5 of the GHG inventory and presents the emissions estimates in metric tonnes of CO_2. The table indicates that an estimated 129,274 tonnes CO_2e emissions from Project construction equipment would be emitted over the course of the entire construction period.

Table III.S-2 Project Construction GHG Emissions

Location	*Construction Equipment*	*Worker Commuting*	*Hauling*	*Total GHG Emissions*
Candlestick Point	56,403	2,913	6,103	***65,419***
Hunters Point Shipyard Phase II	42,895	2,734	18,226	***63,854***
Total	***99,298***	***5,647***	***24,329***	***129,274***

SOURCE: ENVIRON, Updated Project Phasing Effect on Air Quality and Climate Change Analyses, Candlestick Point-Hunters Point Shipyard Phase II Development Plan, 2009.

If these one-time emissions are annualized assuming a 40-year development life (which is likely low), the one-time emissions contribute approximately 3,232 tonnes CO_2e emissions annually. These annualized emissions are added to the total Project-related GHG emissions in Table III.S-3 (Annual Project Related Operational CO_2e Emissions).

[1164] California Air Resources Board Mobile Source Emissions Inventory Program. December 2006. http://www.arb.ca.gov/msei/offroad/offroad.htm.
[1165] Emission Factors (EMFAC2007) model (Version 2.3). November 2006. California Air Resources Board. http://www.arb.ca.gov/msei/onroad/latest_version.htm.
[1166] Urban Emissions Model (URBEMIS) (Version 9.2.4) 2008. Jones & Stokes Associates. Prepared for: South Coast Air Quality Management District. http://www.urbemis.com.
[1167] ENVIRON International Corporation. 2009. *Climate Change Technical Report Candlestick Point–Hunters Point Shipyard Phase II Development Plan*. October (Appendix S to this EIR).

An estimate of "life-cycle" GHG emissions (i.e., GHG emissions from the processes used to manufacture and transport materials used in the buildings and infrastructure) was also performed. As previously stated, this estimate is used for comparison purposes only and is not included in the final GHG inventory because these emissions would be attributable to other industry sectors under AB 32. For instance, the concrete industry is required by law to report emissions and undergo certain early action emission reduction measures. Furthermore, somewhat arbitrary boundaries must be drawn to define the processes considered in the life-cycle analysis of building materials.[1168] Recognizing the uncertainties associated with a life-cycle analysis, the California Air Pollution Control Officers Association (CAPCOA) released a white paper that states: "The full life-cycle of GHG emissions from construction activities is not accounted for in the modeling tools available, and the information needed to characterize GHG emissions from manufacture, transport, and end-of-life of construction materials would be speculative at the CEQA analysis level."[1169]

Life Cycle Assessment (LCA) emissions vary based on input assumptions and assessment boundaries (e.g., how far back to trace the origin of a material). Assumptions made in the LCA are generally conservative. However, due to the open-ended nature of LCAs, the analysis is also highly uncertain.

The LCA evaluates the life-cycle GHG emissions associated with the building materials for this Project. The life-cycle GHG emissions include the embodied energy from the materials manufacture and the energy used to transport those materials to the site. The report then compares the life-cycle GHG emissions to the overall annual Project-related emissions. The materials analyzed in the report include materials for (1) residential and non-residential buildings and (2) site infrastructure.

The LCA estimated the life-cycle GHG emissions for buildings by conducting an analysis of available literature on LCAs for buildings. According to these studies, approximately 75 to 97 percent of GHG emissions from buildings is associated with energy usage during the operational phase; the other 3 to 25 percent of the GHG emissions is due to material manufacture and transport. Using the GHG emissions from the operation of buildings, 3 to 25 percent of building emissions corresponds to approximately 0.9 to 9 percent of the Project emissions.

The LCA calculated the life-cycle GHG emissions for certain components of infrastructure (roads, storm drains, utilities, gas, electricity, and cable). The analysis considered the manufacture and transport of concrete and asphalt only, because it assumed that other construction materials such as steel would be present in much smaller quantities. Because the manufacture of concrete has a higher CO_2 emission factor and most construction estimates higher quantities of concrete than asphalt, the majority of the emissions for infrastructure result from the manufacture of concrete. Because the asphalt and concrete are locally sourced, the transportation emissions are relatively small. If a 40-year lifespan of the infrastructure is assumed, the total annualized emissions from embodied energy in infrastructure materials are approximately 1.8 percent of the Project emissions.

[1168] For instance, in the case of building materials, the boundary could include the energy to make the materials, the energy used to make the machine that made the materials, and the energy used to make the machine that made the machine that made the materials.

[1169] CAPCOA. 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.
http://www.capcoa.org/ceqa/?docID=ceqa&PHPSESSID=df1348d67eff0fc2a8263d19d10dd.

The overall life-cycle emissions, annualized by 40 years, would be 3,068 to 16,285 tonnes CO_2/year, or 2 to 10 percent of the annualized GHG emissions from the Project. The bulk of these emissions (1.4 to 15 percent) would be from general life cycle analysis studies and do not reflect project-specific information.

As previously indicated, the calculations and results presented in the LCA are estimates and are used only for a general comparison to the overall GHG emissions estimated for the Project. LCA emissions vary based on input assumptions and assessment boundaries (e.g., how far back to trace the origin of a material). Assumptions made in the GHG report are generally conservative.

However, due to the open-ended nature of LCAs, and to the fact that literature evaluation, not site-specific studies, was used to analyze the embodied energy, the analysis should be considered to yield highly uncertain results. Additionally, the analysis likely double-counts emissions from other industry sectors.

Long-Term (Operational) Impacts

Long-term operational or annual emissions from the development of this Project include indirect GHG emissions from electricity use in residential and non-residential buildings and emissions from natural gas combustion used in residential and non-residential buildings, mobile sources, municipal sources, area sources, transit services, and waste disposal. Table III.S-3 (Project Annual GHG Emissions) lists the emissions for each of these categories.

Residential Building Emissions

Residential buildings include various types of condos, townhomes, and other multi-family homes of various sizes. The amount of energy and, therefore, the amount of associated GHG emissions emitted per dwelling unit would vary with the type of residential building. Accordingly, information on the type of residential buildings that are planned for the Project is required to estimate GHG emissions.

GHGs are emitted as a result of activities in residential buildings when electricity and natural gas are used as energy sources. Combustion of any type of fuel emits CO_2 and other GHGs directly into the atmosphere; when this occurs in a residential building, it is a direct emission source[1170] associated with that building. GHGs are also emitted during the generation of electricity from fossil fuels. When electricity is used in a residential building, the electricity generation typically takes place off site at the power plant; electricity use in a residential building generally causes indirect emissions of GHGs.

While fuel combustion generates CH_4 and N_2O, the emissions of these GHGs typically comprise less than 1 percent of CO_2e emissions from electricity generation and natural gas consumption[1171]. Fuel oil, kerosene, liquefied petroleum gas, and wood can also be used as fuels, but would likely contribute only in small amounts as combustion sources within residential buildings. Wood burning hearths are addressed in the area sources section below. For direct emission of GHGs used in fuel combustion in residential buildings, CH_4 and N_2O are assumed to contribute a negligible amount of GWP when compared to the CO_2 emissions.

[1170] California Climate Action Registry (CCAR) General Reporting Protocol (GRP), Version 3.1 (January). Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January 2009.pdf, Chapter 8.
[1171] Ibid. Tables C2 and C3. The methane and nitrous oxide emission factors are negligible compared to the total CO_2 emission factor for electricity generation in California.

Energy use in residential buildings is divided into (1) energy consumed by the built environment, and (2) energy consumed by uses that are independent of the construction of the building, such as plug-in appliances. In California, Title 24 governs energy consumed by the built environment, including the HVAC system, water heating, and some fixed lighting. Non-building or 'plug-in' energy use can be further subdivided by specific end-uses (refrigeration, cooking, lighting, etc.).

Energy use for each residential dwelling unit was calculated separately based on data in the CEC-commissioned California Statewide Residential Appliance Saturation Survey for climate zone 5. The energy use for Title 24 regulated systems has been adjusted to account for updates in Title 24 standards based on CEC impact analysis reports. The energy use associated with refrigerators, dishwashers, and clothes washers has been adjusted to account for reduction in energy use associated with ENERGY STAR appliances that would be required if installed by the builder. The resulting energy use quantities were then converted to GHG emissions by multiplying by the appropriate emission factors, incorporating information on local electricity production. All indirect electricity emission factors used for the Project are based on the most recent, 2007, PG&E Power/Utility Reporting Protocol report and have been adjusted to incorporate the 20 percent Renewable Portfolio Standard required by 2010. The Project would replace 256 dwelling units of existing housing at Alice Griffith with new housing; this replacement housing would not be net new and is, therefore, not considered in the GHG emissions inventory. The net Project-related residential GHG emissions would have 19,035 tonnes for Candlestick Point and 6,642 tonnes for Hunters Point Shipyard.

Non-Residential Building Emissions

GHG emissions from non-residential buildings include all structures except residences that may exist in this development such as municipal, commercial, retail, and office space. The amount of energy used, and the associated GHG emissions emitted per square foot of available space vary with the type of non-residential building. For example, food stores are far more energy intensive than warehouses, which have little climate-conditioned space. For developments such as this, the exact types of buildings are typically unknown. As such, not all building categories that may be built as part of the Project are represented below. However, the analysis accounts for all of the non-residential building area. The general types of non-residential buildings analyzed include office space, retail buildings, research and development space, artist studios, community services, hotel, stadium, and performance venue.

Similar to the case for residential buildings, GHGs are emitted as a result of activities in nonresidential buildings for which electricity and natural gas are used as energy sources. While fuel combustion generates CH_4 and N_2O, the emissions of these GHGs typically comprise less than 1 percent of CO_2e emissions from natural gas consumption. Fuel oil, kerosene, liquefied petroleum gas, and wood can also be used as fuels, but generally contribute only in small amounts as combustion sources within non-residential buildings. As such, these minor emissions are not accounted for here.

Similar to energy use in residential buildings, energy use in non-residential buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building such as plug-in appliances. First, the energy use from systems covered by Title 24 (HVAC system, water heating system, and the lighting system) were estimated. Then, energy use from office equipment, plug-in lighting, and other sources not covered by Title 24 were estimated.

Energy use was estimated using the California Commercial End-Use Survey (CEUS) for all building types except for the Stadium. The Stadium energy use was estimated assuming that the new Stadium would be 20 percent more efficient than the energy use reported in the SFCAP for 1990. This is based on the estimate of energy use savings for other NFL stadiums that have recently been replaced.

The resulting emissions were then estimated as the product of the estimated energy use and the appropriate emission factors obtained by incorporating information on local electricity production. All indirect electricity emission factors used for the Project are based on the most recent, 2007, PG&E Power/Utility Reporting Protocol report and have been adjusted to incorporate the 20 percent Renewable Portfolio Standard required by 2010.

The non-residential related GHG emissions for the Project would be 4,263 tonnes CO_2e per year for Candlestick Point and 13,766 tonnes CO_2e per year for Hunters Point Shipyard.

Area Source Emissions

Area source emissions stem from hearths (including gas fireplaces, wood-burning fireplaces, and wood-burning stoves) and small mobile fuel combustion sources such as lawnmowers. Fuel combustion associated with these sources produce direct GHG emissions. Since all of the housing units are multi-family, URBEMIS does not estimate a significant amount of emissions from lawn maintenance equipment and these have not been quantified. Since emissions from natural gas-fired stoves and natural gas heating are already included in the residential sources, calculations based on the URBEMIS method for the remaining types of area sources, natural gas fireplaces was performed.

The Project would have natural gas fireplaces in up to 10 percent of net new residential units. Wood-burning stoves or fireplaces would be prohibited. Direct GHG emissions from these sources were estimated by multiplying the energy use per year by the CO_2 emission factor for natural gas combustion. Annual energy use was determined by the number of fireplaces, the average energy use of each fireplace, and the URBEMIS default fireplace usage rate value of 200 hours/year. An estimated 217 tonnes CO_2 would be generated annually by fuel combustion in natural-gas fireplaces.

Municipal Source Emissions

Municipal sources of GHG emissions that were analyzed as part of the GHG inventory include drinking water and wastewater supply and treatment, lighting in public areas, and municipal vehicles. In general, the majority of municipal sector GHG emissions are related to the energy used to convey, treat, and distribute water and wastewater. Thus, these emissions are generally indirect emissions from the production of electricity to power these systems. Additional emissions from wastewater treatment include CH_4 and N_2O, which are emitted directly from the wastewater.

The amount of electricity required to treat and supply water depends on the volume of water involved. According to the Water Supply Assessment, the Project would generate a total water demand of 1.67 million gallons per day (mgd).[1172]

[1172] Arup. 2009. Candlestick Point–Hunters Point Shipyard Phase II Water Demand Memorandum. September.

Three processes are necessary to supply potable water to residential and commercial users: (1) supply and conveyance of the water from the source; (2) treatment of the water to potable standards; and (3) distribution of the water to individual users. Indirect emissions resulting from electricity use were determined by multiplying electricity use by the CO_2 emission factor provided by the local electricity supplier, PG&E. All indirect electricity emission factors used for the Project are based on the most recent PG&E Power/Utility Protocol report and have been adjusted to incorporate the 20 percent Renewable Portfolio Standard required by 2010. Energy use for different aspects of water treatment (e.g., source water pumping and conveyance, water treatment, distribution to users) was determined using the stated volume of water and energy intensities values (i.e., energy use per unit volume of water) provided by reports from various sources related to San Francisco's water supply system.

Emissions associated with wastewater treatment include indirect emissions necessary to power the treatment process and direct emissions from degradation of organic material in the wastewater. Wastewater treatment direct emissions in the Project are estimated to account for zero tonnes of CO_2e emissions per year since all methane emissions from the wastewater at the Southeast Wastewater Treatment Plant is burned at the flare station or cogeneration plant and non-methane emissions are directly emitted from the wastewater as directed by the plant's air permit.

Indirect GHG emissions from the electricity necessary to power the wastewater treatment process were calculated for the Project. Wastewater in San Francisco would be treated at the Southeast Pollution Control Plant. The electricity required to operate wastewater treatment plant is estimated to be 1,688 kWh per acre foot (AF). Based on the expected amount of wastewater requiring treatment,[1173] this energy intensity factor and the PG&E carbon-intensity factor adjusted to account for the Renewable Portfolio Standard (RPS) were used to calculate the indirect GHG emissions associated with wastewater treatment.

Lighting sources contribute to GHG emissions indirectly, via the production of the electricity that powers these lights. Lighting sources considered in this source category include streetlights, traffic signals, area lighting for parks and lots, and lighting in public buildings. Data from a report by the City of Duluth shows that the amount of electricity demanded for all types of public lighting is 149 kWh per capita per year.[1174] The Project would use energy efficient street lighting. This would reduce street lighting electricity demand by 16 percent.[1175] Using this study, the PG&E-specific carbon-intensity emission factor adjusted for 20 percent RPS and the expected Project population of 23,869, emissions from public lighting were calculated.[1176] This number is likely a conservative estimate since the Project is a master-planned compact community may require a lower number of lights than the City of Duluth.

GHG emissions from municipal vehicles are due to direct emissions from the burning of fossil fuels. Municipal vehicles considered in this source category include vehicles such as police cars, fire trucks, and garbage trucks. Data from reports by Medford, MA; Duluth, MN; Northampton, MA; and Santa Rosa,

[1173] Assumed 91 percent of the water treated is to be reclaimed.
[1174] Skoog., C. 2001. This factor was calculated by summing the total electricity needs for municipal uses and dividing by the Duluth population. The Duluth population was calculated by dividing the city's reported GHG emissions by its reported per capita emissions.
[1175] The resultant energy savings is calculated from the annual energy costs found on page 4 of NYSERDA's 2002 How-to Guide to Effective Energy-Efficient Street Lighting.
[1176] Population estimate provided by Lennar Urban.

California[1177] show that the CO_2 emissions from municipal vehicles would be approximately[1178] 0.05 tonnes per capita per year. Using these studies and the expected Project population of 23,869, emissions from municipal vehicles in the Project were calculated.

In total, all municipal sources including water, wastewater, public lighting, and municipal vehicles for the Project is expected to produce 2,559 tonnes of CO_2e annually.

Solid Waste Disposal Emissions

The residential and non-residential uses at the development would generate waste. A large percentage of this waste would be diverted from landfills either by waste generation reduction, recycling, and composting. San Francisco currently diverts a large portion of its waste generated and has goals to even further reduce the amount of waste sent to a landfill. The remainder of the waste not diverted would be disposed of at a landfill. Landfills emit GHG emissions associated with the anaerobic breakdown of material. The waste disposal rates for the various land uses at the development were estimated based on values reported by the Center for Integrated Waste Management Board (CIWMB).[1179] If no waste disposal rates could be found, waste generation rates for that land use were used. These are likely over-estimates since they do not account for the waste that would be diverted from a landfill. The waste disposal rates were multiplied by the non-biogenic emissions associated with the Altamont Landfill in 2005 which is 0.00674 tonnes of CO_2e emissions per metric ton of waste per year.[1180] The total GHG emissions are anticipated to be 907tonnes CO_2e per year for the Project. These estimates are likely conservative given the fact that future residents would be more conscious of waste and the aggressive goals for waste reduction in San Francisco. In addition, this estimate does not account for the carbon sequestration that would occur as a result of disposal of carbon in the landfill that would not degrade.

Mobile Source (Vehicle) Emissions

The Project mobile source emissions considered for this Project would result from the typical daily operation of motor vehicles by residents and non-residents. ENVIRON estimated GHG emissions based upon all miles traveled associated with net new residential and non-residential trips regardless of internal or external destinations or purpose of trip. Traffic patterns, trip rates, and trip lengths are based upon information from the Candlestick Point–Hunters Point Phase II Development Plan Transportation Study

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[1177] City of Medford. 2001. *Climate Action Plan*. October. http://www.massclimateaction.org/pdf/MedfordPlan2001.pdf.
City of Northampton. 2006. Greenhouse Gas Emissions Inventory. Cities for Climate Protection Campaign. June. http://www.northamptonma.gov/uploads/listWidget/3208/NorthamptonInventoryClimateProtection.pdf.
City of Santa Rosa. Cities for Climate Protection: Santa Rosa. http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CCPFinalReport.pdf.
Skoog., C. 2001. Greenhouse Gas Inventory and Forecast Report. City of Duluth Facilities Management and the International Council for Local Environmental Initiatives.
October.http://www.ci.duluth.mn.us/city/information/ccp/GHGEmissions.pdf.

[1178] In an effort to be conservative, the largest per capita number from these four reports was used.

[1179] CIWMB. 1999. Statewide Waste Characterization Study: Results and Final Report. 340-00-009. http://www.ciwmb.ca.gov/wastechar/Redisp.htm.
CIWMB. 2007. Estimated Solid Waste Generation Rates for Industrial Establishments. http://www.ciwmb.ca.gov/WasteChar/wasteGenRates/Industrial.htm.
CIWMB. 2006. Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups. 341-06-006. http://www.ciwmb.ca.gov/WasteChar/WasteStudies.htm#2006Industry.

[1180] Based on information provided by BAAQMD.

(Transportation Study).[1181] For mobile sources, CH_4 and N_2O are explicitly calculated, multiplied by their respective GWP, and added to the CO_2 emissions, to result in total CO_2e emissions from mobile sources.

The Transportation Study included an estimate of the trip rates incorporating the Project design features. Consistent with one of the options in the OPR Guidance, this section discusses a comparison of Project emissions with the goals of AB 32. Since the 49ers Stadium would replace Candlestick Park, this is not considered to cause new trips from far away. If the Stadium is not built at HPS, it is assumed that a new Stadium would be built elsewhere in the Bay Area and it is unknown if the trips would be shorter or longer for attendees.

The trips and VMT calculated includes all trips and VMT generated by net new Project residential and non-residential land uses. Once the number of trips is determined, the trip type is important. For example, a home based work (HBW) trip is a trip directly from home to work with no stops in-between, or directly from work to home. A home based shopping trip (HBS) is a trip directly from home to shopping or from shopping to home. A home based other trip (HBO) is a trip directly from home to another destination such as school. Non-home based (NHB) trips are trips between work and other types of destinations such as going to the bank during one's lunch hour. For all trip types, directionality is unimportant. The distribution of residential trip types follows the MTC 2030 model defaults.

Since the trip rates are based on weekday conditions, ENVIRON calculated weekend traffic by applying differences between the weekend and the weekday traffic based upon a report by Sonoma Technologies.[1182] Weekend traffic on major highways was assumed to be 80 percent of the weekly capacity, and weekend traffic on small streets was assumed to be 80 percent of weekly capacity.[1183] No adjustment to driving patterns was done for the music venue since this is on a per event basis. The Transportation Study made an estimate of the total number of vehicle trips taking into account use of several alternative modes including public transit, bicycles, and carpooling.

Each type of trip is associated with an average trip length as estimated by Fehr and Peers based on the Caltrans Household Travel Survey for San Francisco County. Total vehicle miles traveled (VMT) were calculated by multiplying the number of trips by the average trip length for each type of trip. The total VMT for Project residents and non-residents is 309,166,932.

The CO_2 emissions from mobile sources were calculated with the trip rates, trip lengths, and emission factors for running and starting emissions from EMFAC2007. EMFAC emission factors from the year 2020 were used based on San Francisco County fleet mix and adjusted to account for Pavley Vehicle Standards. Nitrous oxide, CH_4, and HFCs[1184] are also emitted from mobile sources. The USEPA recommends assuming that CH_4, N_2O, and HFCs account for 5 percent of mobile source GHG emissions, taking into account their GWPs.[1185] Therefore, CO_2 emissions were divided by 0.95 to account for non-CO_2 GHGs.

[1181] CHS Consulting Group, Fehr and Peers, and LCW Consulting. 2009. *Bayview Waterfront Project Transportation Study*.
[1182] Sonoma Technologies, Inc. 2004. *Correction and Analysis of Weekend/Weekday Emissions Activity Data in the South Coast Air Basin*. May.
[1183] A conservative adjustment for weekend travel was assumed for all the trips since information was not available to distinguish between trips on major highways and trips on small streets. The Sonoma Technologies report gives a range of values, but does not present a weighted value, thus a conservative percent reduction in the number of trips was selected.
[1184] HFCs can be emitted from air conditioning systems.
[1185] USEPA. 2005. *Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle*. Office of Transportation and Air Quality. February. (http://www.epa.gov/otaq/climate/420f05004.pdf)

Vehicles associated with the Project would emit approximately 105,520 tonnes CO_2e per year. In an effort to evaluate the assumptions described in the section, the changes in estimated fleet distribution and emission factors would likely improve based on anticipated regulations, over and above those currently enacted in law.

Transit Service GHG Emissions

Emissions from the transit area are associated with increased public transport needed to serve the Project. GHGs are emitted from public buses when the vehicles are in transit and when the vehicles are idling at the curbside. The emissions are based on the net new miles and trips made by transit servicing the Project. The details of the net new transit service were provided by Fehr and Peers. Since San Francisco uses carbon free electricity to power its electric buses and trolleys, the mileage and idling time from these vehicles is not quantified. Total running emissions from transit buses were calculated by multiplying the net new miles and idling time by the GHG emission factors for urban buses. The diesel buses would be diesel-hybrid buses that reduce fuel usage by 25 percent[1186] and San Francisco transit buses use B20 (20 percent biodiesel, 80 percent petroleum diesel).[1187] The USEPA recommends assuming that CH_4, N_2O, and HFCs account for 5 percent of GHG emissions from on-road vehicles, taking into account their GWPs.[1188] To incorporate these additional GHGs into the calculations, the total GHG footprint was calculated by dividing the CO_2 emissions by 0.95.

The total amount of GHG emissions from the transit service is estimated to be 1,730 tonnes of CO_2 per year.

Total Annual Project CO_2 Emissions

As shown in Table III.S-3 (Project Annual GHG Emissions), using all the emission source categories quantified above, the total annual GHG emissions generated from the Project with the design features related to vehicular use is approximately 154,639 tonnes CO_2e per year. The table reveals that the majority of annual Project emissions is the result of vehicle use (68 percent), followed by residential energy consumption (17 percent).

Several emissions sources were not quantified in this inventory, due to their estimated relatively small[1189] contribution to GHG emissions (typically less than 1 percent based upon previous studies). These sources include emissions from recreational sources and refrigeration leaks, which are described in more detail below.[1190] The Project includes neighborhood community areas and parks, which may also include recreation centers. The precise uses in the neighborhood community areas are not known at this time. . As a result of this uncertainty, the GHG inventory prepared for the Project did not quantify these emissions at this time. Emissions associated with leaks of high global warming potential gases such as from refrigeration leaks were not quantified. At the entitlement stage of development, the degree of uncertainty in the potential facilities with sources that may have refrigeration leaks make a meaningful quantification

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1186 *SFMTA Climate Action Plan*. Draft for Public Review, December 19, 2008.
1187 Based on CCAR recommendations, emissions from burning biodiesel are not included in emissions estimation. EMFAC emission factors are further reduced by 20 percent to account for the use of B20.
1188 USEPA. 2005. *Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle.* Office of Transportation and Air Quality. February.
1189 Typically, less than 1 percent of the overall inventory based upon previous studies.
1190 Black carbon was also not considered. Major sources of black carbon emissions are not present at the Project.

of GHG emissions difficult. In addition, since refrigeration systems would be new, they are likely efficient and should be designed to reduce the amount of leaks of high global warming potential gases.

Table III.S-3 Project Annual GHG Emissions

Source	*Candlestick Point (tonnes CO_2e/year)*	*Hunters Point Shipyard Phase II (tonnes CO_2e/year)*	*Total (tonnes CO_2e/year)*
Residential	19,035	6,642	25,677
Non-Residential	4,263	13,766	18,029
Mobile	75,149	30,371	105,520
Municipal	1,793	766	2,559
Area	161	56	217
Waste	532	375	907
Transit Area	865	865	1,730
Total (annual emissions)	***101,798***	***52,841***	***154,639***

SOURCE: ENVIRON, 2009.

III.S.5 Impacts

Significance Criteria

The City and County of San Francisco has not formally adopted significance standards for climate change impacts but generally considers that implementation of a project would have a significant GHG impact if it were to:

S.a Conflict with the state goal of reducing GHG emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32 (*California Global Warming Solutions Act of 2006*), such that the project's GHG emissions would result in a substantial contribution to global climate change

S.b Conflict with San Francisco's *Climate Action Plan* such that it would impede implementation of the local GHG reduction goals established by the 2008 Greenhouse Gas Reduction Ordinance

Analytic Method

The release of GHGs in general and CO_2 specifically into the atmosphere is not of itself an adverse environmental effect. It is the effect that increased concentrations of GHG concentrations of GHG including CO_2 in the atmosphere has upon the earth's climate (i.e., climate change) and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although emissions modeling can estimate a project's incremental contribution of CO_2 into the atmosphere, it is not feasible to determine whether or how an individual project's relatively small incremental contribution (on a global scale) might translate into physical effects on the environment. Because Earth's climate is determined by the complex interaction of different components of Earth and its atmosphere, it is not possible to discern whether the presence or absence of GHG emitted by the Project would result in any measurable impact that would intensify climate change or its adverse environmental impacts.

No state, local, or the applicable regional air quality agency has adopted a methodology or quantitative threshold that can be applied to a specific development or construction project to evaluate the significance of an individual project's contribution. Therefore, this analysis considers GHG emissions from the Project against the anticipated GHG emissions assuming regulations consistent with ARB's Scoping Plan 2020 estimate of a No Action Taken scenario. This compares the Project GHG emission inventory to the GHG emissions that would occur from a community that would be built today without Project design features and energy reduction commitments made by Project Applicant. This baseline comparison is referred to as No Action Taken (NAT), which follows the regulations considered by ARB in developing its 2020 No Action Taken estimate as part of the Scoping Plan. This represents the GHG emission inventory if things were continued to be built according to current standards in place at the time of the Scoping Plan. In addition, this analysis considers GHG emissions from Project implementation in relation to total GHG emissions in the Bay Area and California. It also considers steps that California intends to take to reduce GHG emissions and actions the City and County of San Francisco is taking to reduce GHG emissions, including the City's Climate Action Plan and 2008 Greenhouse Gas Reduction Ordinance.

The state Office of Planning and Research (OPR) published informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents.[1191] According to the OPR, lead agencies should determine whether GHGs may be generated by a project, and if so, quantify or estimate the GHG emissions by type and source. The lead agency must assess whether those emissions are individually and/or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

As stated above in Section III.S.3, the BAAQMD has not adopted quantitative thresholds of significance for construction-related emissions. However, the BAAQMD is developing quantitative CEQA significance thresholds for construction- and operations-related emissions of criteria pollutants, precursors, TACS, and GHGs.[1192] The BAAQMD expects to adopt these new thresholds of significance later this year. Therefore, in anticipation of the BAAQMD's future adoption of new quantitative significance thresholds for operations-related emissions, the Draft EIR also includes a quantitative analysis of the Project's construction- and operations-related emissions based on the draft BAAQMD significance thresholds regarding the Project's operational emissions.

[1191] State of California, Governor's Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change through California Environmental Climate Act (CEQA) Review*, June 19, 2008 (hereinafter "OPR Advisory").
[1192] BAAQMD. 2009. *Revised Draft Options and Justification Report California Environmental Quality Act Thresholds of Significance.* October.

Project Impacts

Impact GC-1: Conflict with GHG Emissions Goals

Impact GC-1 **The Project would not result in a substantial contribution to global climate change by increasing GHG emissions in a manner that conflicts with the state goal of reducing GHG emissions in California to 1990 levels by 2020 (e.g., a substantial contribution to global climate change) or conflicts with San Francisco's Climate Action Plan by impeding implementation of the local GHG reduction goals established by the San Francisco 2008 Greenhouse Gas Reduction Ordinance. (Less than Significant with Mitigation)** ***[Criteria S.a and S.b]***

As explained previously, the analysis of Project emissions in the GHG emission inventory assumed certain Project features. The land use mixes and basic land plan design proposed in the Project Description are fundamental aspects of the Project and include certain features assumed in the GHG emissions inventory, including providing neighborhood-serving retail; providing automobile, public transportation and pedestrian connections between the Shipyard, Candlestick Point, and the larger Bayview neighborhood; providing for transportation and open space corridors; and integrating land use patterns with a multimodal street network that facilitates walking and cycling for internal trips and transit for trips of greater distance. Other Project features assumed in the GHG emission inventory are more conceptual, such as landscape plans and plans related to energy efficiencies in building design. Further, transportation features proposed as part of the Project that would be implemented in part by SFMTA are identified in Section III.D (Transportation and Circulation) as mitigation measures. Because some of the Project features are conceptual, and other Project features are identified elsewhere in the document as mitigation measures, this section identifies mitigation measures MM GC-1 through MM GC-4 as measures that also would be needed to ensure that the reductions considered in developing the GHG emission inventory take place as residential and employment-generating uses are developed.

Because the development plan is conceptual, and there could be modifications during the entitlement and development process, mitigation measures MM GC-1 through MM GC-4 would be implemented to ensure that the reductions considered in developing the GHG emission inventory take place as residential and employment-generating uses are developed.

MM GC-1 *Plant up to 10,000 trees net new trees at the Project site and in the community.*

MM GC-2 *Exceed the 2008 Standards for Title 24 Part 6 energy efficiency standards for homes and businesses would by at least 15 percent.*

MM GC-3 *Install ENERGY STAR appliances, where appliances are offered by homebuilders*

MM GC-4 *Use light emitting diode (LED) based energy efficient street lighting.*

Implementation of mitigation measures MM GC-1 through MM GC-4 would ensure that adequate GHG emission reductions are provided as residential and employment-generating uses are constructed and occupied. Impacts related to climate change and GHG emissions for the operational phase of the development would be less than significant.

Construction impacts

The Project's GHG emissions from construction-related activities and changes in vegetation sequestration would be short-term and would only occur once unlike operational emissions that would continue for the duration of the Project. Since the Project is predicted to result in a net sequestration of carbon due to vegetation as compared to the existing condition, GHG emissions associated with vegetation changes is not an adverse impact. Table III.S-2 summarizes the modeled Project-generated, construction-related GHG emissions. These emissions would contribute to regional increases in GHG emissions and associated climate change effects.

Implementation of the Project would result in a total of 105,587 tonnes of CO_2e of construction-related activities over the 16 years of construction activities. Over the construction time period, the construction-related GHG emissions average 6,600 tonnes per year. The statewide annual GHG inventory (2004) is estimated at 479,740,000 tonnes. For context purposes, the average annual construction emissions would represent 0.0014 percent of the statewide total emissions for a year. The Bay Area Greenhouse Gas Emission Inventory Projections indicate that the 2007 inventory of 102,552,991 tonnes of CO_2e has approximately 1.7 percent of these emissions are attributable to construction equipment emissions, 1.8 million metric tonnes and would continue to account for about the same proportion into the future. The estimated annual average construction-related emissions for the Project represent less than one percent of the construction equipment emissions for the Bay Area.

Existing ARB regulations (Title 13 of the CCR, Section 2480 and 2485), which limit idling of diesel-fueled commercial motor vehicles, would help to limit GHG emissions associated with construction-related vehicles. In addition, the ARB's proposed Early Action Measures (EAMs) (pursuant to the *California Global Warming Solutions Act of 2006*) include other emission reduction measures for diesel trucks and diesel off-road equipment. The ARB is expected to review and adopt the EAMs by January 1, 2010, so equipment used for construction of the Project after 2010 could be subject to these requirements. Subsequent to the release of the proposed EAMs, the ARB developed the AB 32 Scoping Plan outlining the state's strategy to achieve AB 32's 2020 GHG emissions limit. Once measures from the EAM and Scoping Plan go into effect, construction contractors on the projects would be subject to these requirements, and the Project would implement these measures as required; emission from Project construction activities would be reduced accordingly.

Given the requirements of ARB's scoping plan and EAMs that would apply to construction contractors, these emissions are less than significant for the cumulative impact to climate change because the Project would not conflict with state goals or the SFCAP.

Operational Emissions

Operation of the Project would result in GHG emissions from building energy use, mobile sources, area sources, energy associated with water usage, and solid waste disposal. Table III.S-3 summarizes the modeled Project- related GHG emissions. These emissions would contribute to regional increases in GHG emissions and associated climate change effects.

Implementation of the Project would result in a total of 154,639 tonnes CO_2e per year. For context purposes, the Bay Area Greenhouse Gas Emission Inventory Projections indicate that annual emissions in the San Francisco Bay Area Air Basin are 102,552,991 tonnes per year. The Project would represent 0.15

percent of the Bay Area GHG emissions. Based on the current statewide inventory (2004) of 479,740,000, the Project annual operational emissions would represent 0.0322 percent of the statewide total emissions.

The Scoping Plan outlines various actions the State could take to reduce GHG emissions across various emission source categories. One area of this is building energy efficiency through improvements in building codes and implementation of green building ordinances. With mitigation, when residential buildings are considered, compared to the 2005 Title 24 building code basis used in the Scoping Plan, the Project's residential GHG emissions would be 20 percent better than the ARB Scoping Plan No Action Taken scenario. Table III.S-4 (Annual GHG Emissions Comparison of Project and ARB Scoping Plan No Action Taken Scenario) shows the ARB Scoping Plan No Action Taken Scenario estimates as well as the Project GHG emissions for comparison purposes. Similarly, its commercial buildings would result in 18 percent reduction in GHG emissions due to energy efficiency measures. Another area is transportation related emissions.

Table III.S-4 Annual GHG Emissions Comparison of Project and ARB Scoping Plan No Action Taken Scenario

Source	*No Action Taken*	*Project*	*Difference*	*Percent Difference*
Residential	32,286	25,677	6,609	20%
Non-Residential	21,863	18,028	3,835	18%
Mobile	258,330	105,520	152,810	59%
Municipal	2,756	2,559	197	7%
Area	217	217	0	0%
Waste	907	907	0	0%
Transit Service	2,884	1,730	1154	40%
Total	***319,243***	***154,638***	***164,605***	***52%***

SOURCE: ENVIRON, 2009.

Several measures in the Scoping Plan are aimed at reducing transportation related emissions including SB 375 which encourages regional transportation planning, vehicle fuel efficiency measures, transit oriented development, mixed-use of land, and urban infill development projects. Consistent with several of these strategies, the Project transportation-related emissions represent a 59 percent reduction in GHG emissions from the ARB Scoping Plan No Action Taken scenario, as shown in Table III.S-4. Transit vehicle emissions would be 40 percent lower due to the use of diesel hybrid buses as shown in Table III.S-4.

Reduction in the carbon-intensity of the electricity supply through implementation of renewable portfolio standards would impact the GHG emissions associated with not only buildings, but also the GHG emissions attributable to the embedded energy in water. Through water efficiency, efficient street lighting, and improved energy carbon intensity, the municipal sources would result in the 7 percent reduction in emissions compared to the regulations assumed in the ARB Scoping Plan No Action Taken scenario as shown in Table III.S-4. These reductions for all of the major operational categories are large and result in a total of 52 percent reduction in GHG emissions as compared to the ARB Scoping Plan No Action Taken scenario and show the progress this Project is making in reducing GHG emissions.

Furthermore, the City and County of San Francisco has additional regulations and ordinances that would help to limit GHG emissions associated with Project-related operational emissions. These include the green building ordinance, greenhouse gas reduction ordinance, "transit first" policy, and bicycle plan. All of these measures would serve to reduce Project-related GHG emissions. In addition the Project Applicant is committed to several mitigation measures included in the GHG emission inventory analysis that reduce GHG emissions.

Given the Project design as a dense, infill mixed-use project, with a transit-oriented design, the mitigation measures identified previously, the Project's large reductions in GHG emissions as compared to the ARB Scoping Plan No Action Taken scenario, and the continuing implementation of GHG reduction actions by the City and County of San Francisco, the Project would not conflict with the state's goals of reducing GHG emissions to 1990 levels by 2020, or the City's GHG reduction goals established in the Greenhouse Gas Reduction Ordinance, and would not result in a significant cumulative impact.

BAAQMD Draft GHG Thresholds

As discussed above, BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2, which would apply to mixed-use projects, such as this, is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year.

In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized.

The BAAQMD also suggested some guidance on how to prepare a GHG emission inventory. For operational emissions, the BAAQMD suggests quantifying residential, non-residential, mobile, water, and area sources. The guidance recommends generalized values for energy use for various land use types and generalized emission factors which don't account for local electricity emission factors or newer vehicle efficiency regulations. The operational emissions estimated for the Project would include additional source categories not included in the BAAQMD proposed methodology for quantifying GHG operational emissions. These additional source categories include solid waste disposal and transit services. The exclusion of these sources from the inventory would likely lower the operational emissions per service population. The operational emissions estimated for the Project utilized different emission factors and methodologies. These include the carbon intensity used for electricity, estimates of building energy use, and vehicle emission factors, which the alteration of these would likely increase the operational emissions per service population based on only changing the carbon intensity emission factor. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change.

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CHAPTER IV **Project Variants**

IV.A INTRODUCTION

This section introduces six variants of the Project that were formulated by the Agency, the City and Lennar Urban. These variants are addressed at a project level of detail in this chapter of this EIR, and include the following:

- Variant 1: San Francisco 49ers move outside the project area (no football stadium constructed at HPS Phase II)—R&D Variant
- Variant 2: San Francisco 49ers move outside the project area (no football stadium constructed at HPS Phase II)—Housing Variant
- Variant 2A: San Francisco 49ers move outside the project area (no football stadium constructed at HPS Phase II)—Housing/R&D Variant
- Variant 3 (Tower Variants A, B, C, and D): Four Candlestick Point tower variants would have the same land use program and overall description as with the Project, but would have different locations, massings, and heights for residential towers at Candlestick Point
- Variant 4: A utilities variant would include an automated solid waste collection system, decentralized wastewater treatment, and district energy
- Variant 5: Shared stadium where both the San Francisco 49ers and Oakland Raiders would play at the stadium at HPS Phase II

Three variants (Variants 1, 2, and 2A) address the scenario of the San Francisco 49ers moving to the City of Santa Clara or elsewhere with no football stadium constructed at HPS Phase II. Each of those three variants includes a different land use program at the HPS Phase II site. Variant 1 (R&D Variant) would include increases in R&D space at the stadium location. Variant 2 (Housing Variant) would relocate 1,350 residential units from Candlestick Point to the stadium site. Variant 2A (Housing/R&D Variant) would relocate 1,650 housing units from Candlestick Point to the stadium site, and, in addition, includes an additional 500,000 sf of R&D compared to the Project (for a total of 3,000,000 sf of R&D); 1,000,000 sf of the total R&D for Variant 2A would be constructed on the stadium site along with the residential uses.

The Candlestick Point Tower Variant (Variant 3) would have the same land use program and overall description as the Project, but would have different locations, massings, and heights for residential towers at Candlestick Point (expressed as four options for this variant: Candlestick Point Tower Variants A, B, C, and D).

A Utilities Variant (Variant 4) would include an automated solid waste collection system, decentralized wastewater treatment, and district energy. A 49ers/Raiders Shared Stadium Variant (Variant 5) would include the scenario of a shared stadium, where both the 49ers and Oakland Raiders would play at a new stadium at HPS Phase II.

None of the variants would alter the Project Objectives, which are provided in detail in Chapter II (Project Description) of this EIR. The variants are analyzed at a project level of detail, which is equal to the Project

analysis included in Chapter III (Environmental Setting, Impacts, and Mitigation Measures), Section III.A through Section III.S of this EIR. The environmental impacts that would result from implementation of the variants are presented following the description of each variant. A comparison of the variant development programs to the Project is presented in Table IV-1 (Comparison of Variants to the Project). Table IV-2 (Impact Comparison of Project Variants) summarizes the effects of the Project compared to the variants.

Most of the features of the variants would be similar to the features of the Project. None of the variants would alter the Project Objectives, which are provided in detail in Chapter II (Project Description). The Project could be approved in combination with Variants 3 (Tower Variants A, B, C, and D), 4, and/or 5, any of which can be overlaid on the Project. Variants 1, 2, and 2A represent variants of the Project without a stadium; either of these variants, if approved, could also include components of Variants 3 (Tower Variants A, B, C, and D), 4, and/or 5. For all of these variants, this Chapter IV (Project Variants) provides an environmental analysis such that this EIR would be adequate under CEQA for purposes of review and approval for any of the variants of the Project either individually or in combination with elements of the Project. The variants are analyzed at a project-level of detail, which is equal to the Project analysis included in Chapter III (Environmental Setting, Impacts, and Mitigation Measures) Section III.A through Section III.S of this document. The environmental impacts that would result from implementation of the variants are presented following the description of each variant. A comparison of the variant development programs to the Project is presented in Table IV-1 (Comparison of Variants to the Project). Table IV-2 (Impact Comparison of Project Variants) summarizes the effects of the Project compared to the variants.

Table IV-1 Comparison of Variants to the Project

Differences	*Project*	*Variant 1: R&D Variant (No Stadium, Additional R&D)*	*Variant 2: Housing Variant (No Stadium, Housing)*	*Variant 2A: Housing/ R&D Variant (No Stadium)*	*Variant 3: Candlestick Point Tower Variants (Different Tower Heights and Locations, Larger Floor Plates)*	*Variant 4: Utilities Variant (Additional On-Site Infrastructure)*	*Variant 5: 49ers/Raiders Shared Stadium*
						Same overall development plan as Project, but with minor shifts in building locations to accommodate 570,000 gsf for the proposed utility systems (with 330,000 gsf located below ground).	Same development plan as Project
Land Use Plan							
Residential (units)—Candlestick Point	7,850	7,850	6,500	6,225[a]	7,850	7,850	7,850
Residential (units)—Hunters Point Phase II	2,650	2,650	4,000	4,275[a]	2,650	2,650	2,650
					Same number of residential units, but different placement of towers		
Office	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Research & Development (gsf)	2,500,000	5,000,000	2,500,000	3,000,000	2,500,000	2,500,000	2,500,000
Regional Retail	635,000	635,000	635,000	635,000	635,000	635,000	635,000
Neighborhood Retail	250,000	250,000	250,000	250,000	250,000	250,000	250,000
			Same overall amount of neighborhood retail as Project, but different distribution within HPS Phase II (refer to text for a description)	Same overall amount of neighborhood retail as Project, but different distribution within HPS Phase II (refer to text for a description]			
Tower Floor Plates	10,000 sf	10,000 sf	10,000 sf	10,000 sf	12,500 sf	N/A	N/A
Football Stadium (seats)	69,000 Stadium built by 2017	0	0	0	69,000 Stadium built by 2017	69,000 Stadium built by 2017	69,000 Shared stadium with 49ers and Oakland Raiders Stadium site built by 2017
Yosemite Slough Bridge	Auto/BRT/Ped	BRT/Ped	BRT/Ped	BRT/Ped	Auto/BRT/Ped	Auto/BRT/Ped	Auto/BRT/Ped

Table IV-1 Comparison of Variants to the Project

Differences	*Project*	*Variant 1: R&D Variant (No Stadium, Additional R&D)*	*Variant 2: Housing Variant (No Stadium, Housing)*	*Variant 2A: Housing/ R&D Variant (No Stadium)*	*Variant 3: Candlestick Point Tower Variants (Different Tower Heights and Locations, Larger Floor Plates)*	*Variant 4: Utilities Variant (Additional On-Site Infrastructure)*	*Variant 5: 49ers/Raiders Shared Stadium*
Parks, Open Space, and Recreation Uses							
Total Parks, Open Space, and Recreational Uses	336.4	327.0	349.4	326.6	336.4	336.4	337.5
New Parks	148.1	160.5	158	159	148.1	148.1	148.6
Sports Fields and Active Recreation	91.6	69.8	96.7	70.9	91.6	91.6	91.6
State Parklands (acres)	96.7	96.7	96.7	96.7	96.7	96.7	96.7

SOURCE: Lennar Urban, 2010.

a. The bridge would be open to automobiles only on game days.

Table IV-2 Impact Comparison of Project Variants

		Impacts								
					Variant 3: Candlestick Point Tower Variants					
	Topic	Variant 1: R&D Variant (No Stadium, Additional R&D)	Variant 2:HousingVariant (No Stadium, Housing)	Variant 2A: Housing Variant with R&D (No Stadium)	Tower Variant 3A	Tower Variant 3B	Tower Variant 3C	Tower Variant 3D	Variant 4: Utilities Variant (Additional On-Site Infrastructure)	Variant 5: 49ers/ Raiders Shared Stadium
III.B	Land Use and Plans	=	=	=	=	=	=	=	=	=
III.C	Population, Housing, and Employment	=	=	=	=	=	=	=	=	=
III.D	Transportation and Circulation	>	<	>	=	=	=	=	=	=
III.E	Aesthetics	=	<	<	>	>	>	>	=	=
III.F	Shadows	<	<	<	>	=	<	<	=	=
III.G	Wind	<	<	<	=	=	=	=	=	=
III.H	Air Quality	=	=	=	=	=	=	=	=	=
III.I	Noise	>	<	=	=	=	=	=	=	=
III.J	Cultural Resources and Paleontological Resources	=	=	=	=	=	=	=	=	=
III.K	Hazards and Hazardous Materials	=	=	=	=	=	=	=	=	=
III.L	Geology and Soils	=	=	=	=	=	=	=	=	=
III.M	Hydrology and Water Quality	>	<	=	=	=	=	=	<	=
III.N	Biological Resources	=	=	=	=	=	=	=	=	=
III.O	Public Services	>	<	=	=	=	=	=	=	=
III.P	Recreation	=	=	=	=	=	=	=	=	=
III.Q	Utilities	=	=	=	=	=	=	=	<	=
III.R	Energy	=	=	=	=	=	=	=	=	=
III.S	Greenhouse Gas Emissions	>	=	=	=	=	=	=	=	=

SOURCE: PBS&J, 2009.

Each topic is compared to the Project and for each impact area, impacts are equal to (=), greater than (>), or less than (<) the Project impacts.

IV.B VARIANT 1: R&D VARIANT (NO STADIUM—ADDITIONAL RESEARCH & DEVELOPMENT)

IV.B.1 Overview

The R&D Variant assumes that the 49ers Stadium would not be constructed, and, instead, additional R&D uses emphasizing emerging technologies would be developed at HPS Phase II. Total R&D uses with this Variant would be 5,000,000 gsf, compared to 2,500,000 gsf with the Project and developed on HPS Phase II. The land use program for Candlestick Point would remain the same as the Project. Parks and sports field areas at HPS Phase II would be decreased compared to the Project because the total development area for R&D uses would be increased.

Table IV-3 (R&D Variant Land Use Summary) presents the land use summary for the variant; Table IV-4 (R&D Variant HPS Phase II Proposed Land Use Summary) presents the land use summary on HPS Phase II. Figure IV-1 (R&D Variant Land Use Plan) illustrates proposed R&D Variant land uses.

IV.B.2 Project Objectives

The objectives for the R&D Variant would be the same as for the Project. In particular, the R&D Variant was prepared to address the following portion of Objective 1:

- Implement the CP-HPS Development Plan with public benefits, whether or not the 49ers decide to remain in San Francisco, including developing alternate uses for the stadium site on the Shipyard Property that are consistent with the overall CP-HPS Development Plan objectives.

A full list of Project objectives is provided in Section II.D (Project Objectives).

IV.B.3 Characteristics

Section II.E (Project Characteristics) outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. While many of these components of the Project would also apply to this variant, the discussion below outlines the principal differences.

Candlestick Point

- The land use program outlined in the Chapter II for Candlestick Point would be the same for the R&D Variant (Variant 1), with fewer housing units.[1193] The discussion below is focused on the changes that would occur at HPS Phase II.

[1193] The number of residential units in each district may be adjusted depending on market demand; however, the sum total of housing units for Candlestick Point would not exceed 7,850 units.

Table IV-3 R&D Variant Land Use Summary

Land Use		*Candlestick Point*[a]	*HPS Phase II*	*Total*
Residential				
Residential Density Range I (15 to 75 units per acre)		750	680	1,430
Residential Density Range II (50 to 125 units per acre)		3,215	1,415	4,630
Residential Density Range III (100 to 175 units per acre)		2,445	265	2,710
Residential Density Range IV (175 to 285 units per acre)		1,440	290	1,730
	Total (units)	***7,850***	***2,650***	***10,500***
Retail				
Regional Retail (gsf)		635,000	N/A	635,000
Neighborhood Retail (gsf)		125,000	125,000	250,000
	Total (gsf)	***760,000***	***125,000***	***885,000***
Office (gsf)		150,000	N/A	150,000
Research & Development		N/A	5,000,000	5,000,000
Hotel (gsf)		150,000	N/A	150,000
Rooms		220	N/A	220
Artists' Studios/Art Center (gsf)		N/A	255,000	255,000
Community Services (gsf)[c]		50,000	50,000	100,000
Parks & Open Space				
New Parks (acres)		8.1	152.4	160.5
New Dual-Use Sports Fields/Multi-Use Lawn and Stadium Parking and Waterfront Recreation (acres)		N/A	69.8	69.8
Existing State Parkland Improved (acres)		91.0	N/A	91.0
New State Parkland (acres)		5.7	N/A	5.7
	Total (acres)	***104.8***	***222.2***[d]	***327.0***
Marina (slips)		N/A	300	300
Performance Venue/Arena (gsf)		75,000	N/A	75,000
Seats		10,000	N/A	10,000
Parking (spaces)				
Residential (structured)		7,850	2,650	10,500
Commercial (structured)		2,346	7,028[f]	9,374
General and Commercial (on-street)		1,360	1,678[f]	3,038

SOURCE: Lennar Urban, 2009.

a. Same as Project.
b. Research and development uses are doubled compared to the Project.
c. Community facilities may be provided that cumulatively exceed 100,000 square feet. If so, the Project contemplates an equal reduction in retail and/or research and development and/or office use. Total uses would not exceed those amounts identified in this table.
d. Parks and sports field areas at HPS Phase II would be reduced compared to the Project because land would not be reserved for dual-use turf, which allows for game day parking and active playing fields.
e. Commercial and on-street parking at HPS Phase II would be increased compared to the Project to provide parking for the additional R&D space.
f. Although there has been consideration of ferry service at HPS-II during the years of planning for this project, at this time there is no plan or specific proposal from the WETA to provide such service. While the development plan for HPS-Phase II, including the design of the shoreline improvements, would not preclude the future accommodation of a ferry terminal and ferry service should WETA decide in the future to propose and pursue such a project, it is not proposed as part of the project studied in this EIR. Any such future proposal by WETA would require a separate environmental review under CEQA.

Table IV-4 R&D Variant HPS Phase II Proposed Land Use Summary

District	*Net Acres*[a]	*Dwelling Units*	*Density*	*Neighborhood Retail (gsf)*	*Artist Space (gsf)*	*R&D (gsf)*	*Community Services (gsf)*	*Total Commercial (gsf)*	*Parks (acres)*
Hunters Point Shipyard North	27.30	2,085	I, II, III, IV	25,000	0	0	0	25,000	19.9
Hunters Point Shipyard Village Center	7.55	125	I	25,000	255,000	0	0	280,000	15.6
Research & Development	26.22	440	I, II	75,000	0	2,000,000	0	2,075,000	25.3
Hunters Point Shipyard South	62.09[b]	0	N/A	0	0	3,000,000	50,000	3,050,000	161.4
Total	***123.16***	***2,650***	***N/A***	***125,000***	***255,000***	***5,000,000***[c]	***50,000***[d]	***5,430,000***[c]	***222.2***[e]

SOURCE: Lennar Urban, 2009.

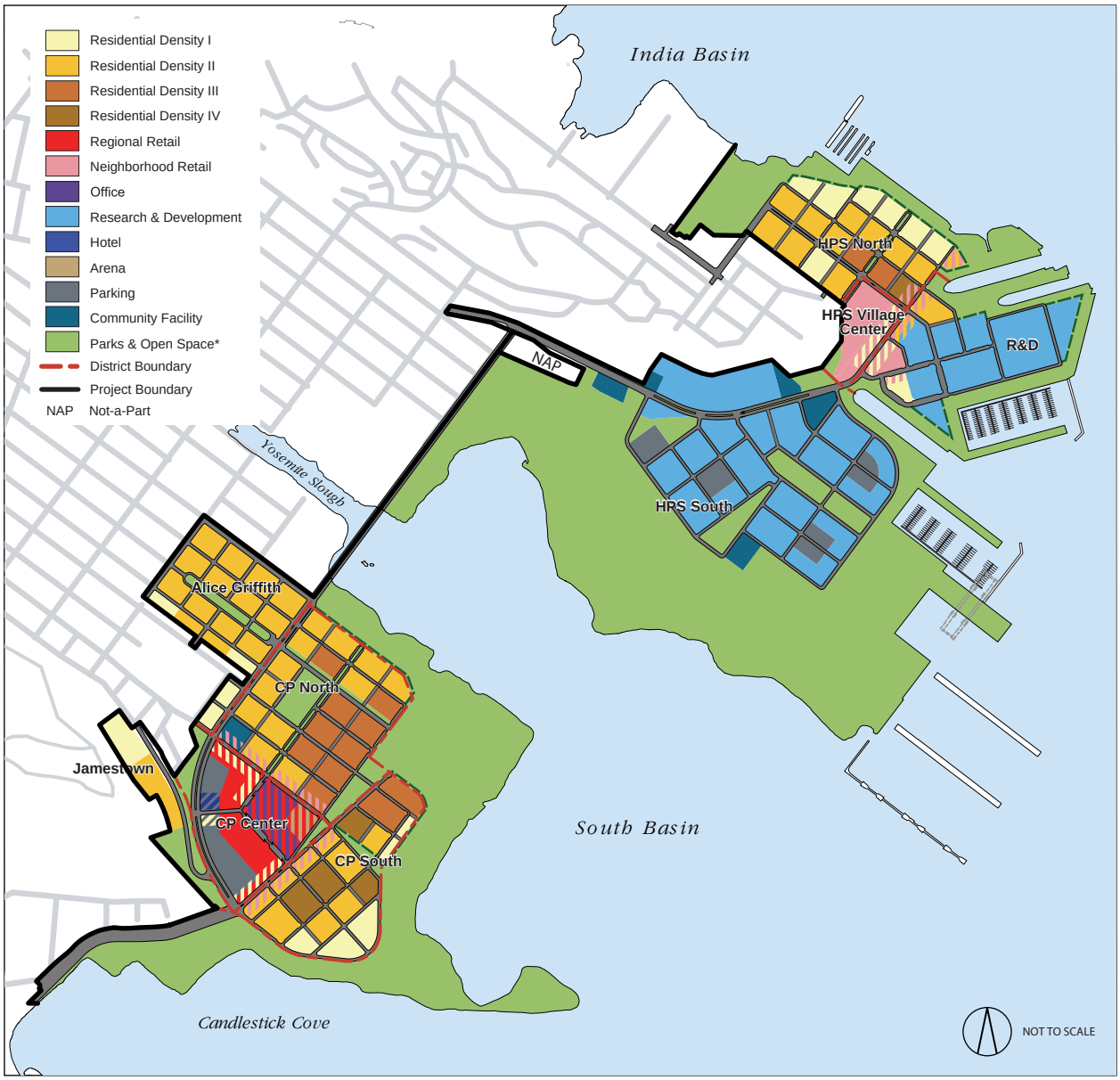
a. Net acreage excludes the street network.

b. The net acreage of the HPS South district would be increased compared to the Project (32.26 acres with stadium).

c. Research and development uses are doubled compared to the Project.

d. Community facilities parcels are intended to provide the existing BVHP community and the future Project community with dedicated land for uses designed to provide, preserve and leverage such critical local resources as social services, education, the arts and other community services, including public safety facilities such as fire and police stations and facilities for the benefit of senior citizens. Additional uses proposed for the community facilities parcels such as retail, services, offices, and R&D space, beyond the 100,000 proposed for community facilities, would be absorbed within the retail or R&D program proposed in HPS Phase II. Total uses would not exceed those amounts identified in this table

e. Parks and sports fields areas at HPS Phase II would be reduced compared to the Project because the total development area for R&D uses would be increased.



SOURCE: Lennar Urban, 2009.

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FIGURE IV-1

Candlestick Point — Hunters Point Shipyard Phase II EIR

R&D VARIANT LAND USE PLAN

Districts

As discussed in Chapter II, the HPS Phase II land use plan would consist of four districts: HPS Village Center, HPS North, R&D, and HPS South. The changes proposed with the R&D Variant compared to the Project would primarily affect the land use plan for the R&D and HPS South districts. The land uses in all other districts would be consistent with the Project, as described in detail in Chapter II. A summary of the development proposed in each of the districts with the R&D Variant (Variant 1) is provided in Table IV-4.[1194] Figure IV-2 (R&D Variant Maximum Building Heights) illustrates the maximum building heights for the R&D Variant.

Hunters Point Shipyard South

With the R&D Variant, the 69,000-seat National Football League stadium proposed with the Project would not be constructed. Instead, the R&D Variant would result in construction of 3,000,000 gross square feet (gsf) of R&D uses in the HPS South district. Total R&D uses with this Variant would be 5,000,000 gsf, compared to 2,500,000 gsf with the Project. Parking to serve game-day patrons proposed for the R&D development site north of Crisp Road would not be required. As described below, the Sports Field Complex proposed with the R&D Variant would be 40.7 acres (19 acres smaller than the Sports Field Complex proposed with the Project).

Parks and Open Space

The R&D Variant parks and open space on Candlestick Point would be the same as the Project; this discussion focuses on HPS Phase II changes. The R&D Variant would include additional parks and would reconfigure the design and sizes of parks and open space areas at HPS Phase II compared to the Project. The Sports Field Complex proposed with the R&D Variant would be 40.7 acres, which is 19 acres less than the Sports Field Complex proposed with the Project. Approximately 9.4 acres of new parks and plaza spaces are proposed to be located adjacent to the R&D uses. With the R&D Variant, a total of 222.2 acres of parkland would be provided at HPS Phase II, 9.4 acres less than proposed with the Project. Table IV-5 (R&D Variant HPS Phase II Parks and Open Space) presents the proposed parks and open space at HPS Phase II in the R&D Variant. Figure IV-3 (R&D Variant Parks and Open Space) illustrates the location of the proposed parks and open space.

Transportation and Circulation

A new Yosemite Slough bridge serving transit, bike, and pedestrian traffic only would extend Arelious Walker Drive from Candlestick Point to HPS Phase II. The additional four auto lanes on the bridge to serve game-day traffic, proposed with the Project, are not included in the R&D Variant. The bridge would be approximately 40-feet wide and would cross the slough at the same location as the Project. The bridge and its approach streets would have two dedicated transit lanes and a separate Class I bicycle and pedestrian lane, which would be open at all times.

[1194] The number of residential units in each district may be adjusted depending on market demand; however, the sum total of housing units for HPS Phase II would not exceed 2,650 units.



SOURCE: Lennar Urban, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

R&D VARIANT MAXIMUM BUILDING HEIGHTS

FIGURE IV-2

Table IV-5 R&D Variant HPS Phase II Parks and Open Space

Park/Open Space		*Acres*
New Parks		
Northside Park		12.8
Waterfront Promenade		31.9
Heritage Park		15.6
Grasslands Ecology Park at Parcel E		44.9
Grasslands Ecology Park at Parcel E-2		37.8
Hunters Point Park Blocks		4.5
Hunters Point Wedge Park		2.8
R&D Plaza		2.1
	Subtotal	*152.4*
New Sports Fields and Active Urban Recreation		
Sports Field Complex		40.7
Multi-Use Lawn		22.4
Waterfront Recreation & Event Pier		6.7
	Subtotal	*69.8*
	Total	***222.2***
	Project Total	***239.5***

SOURCE: Lennar Urban, 2009.

The primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas Avenue to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.

At HPS Phase II, additional roadways to serve the R&D uses on HPS South would be included and commercial parking would be increased to serve the additional R&D space, compared to the Project.

Infrastructure

The location of major infrastructure improvements would be very similar to that which is proposed for the Project but rather than terminating at the stadium site, the improvements would be sited under the roadways of the HPS South district. Stormwater treatment methods are designed for site-specific conditions and have been identified for the R&D Variant and are discussed below.[1195]

[1195] Arup, *Candlestick Point/Hunters Point Shipyard LID Stormwater Opportunities Study*, August 2009.



SOURCE: Lennar Urban, RHAA, 2009.

PBS&J 10.22.09 08068 | JCS | 09

Candlestick Point — Hunters Point Shipyard Phase II EIR

R&D VARIANT PARKS AND OPEN SPACE

FIGURE IV-3

Implementation

- Build-out of the R&D uses would begin in 2011, with completion in 2031. Figure IV-4 (R&D Variant Building and Park Construction Schedule) illustrates the overall sequence of development for the R&D Variant (Variant 1).

IV.B.4 Potential Environmental Effects

Overall, the R&D Variant would increase the total amount of development compared to the Project due to an increase in R&D space at HPS Phase II by 2,500,000 square feet over the Project and the reduction of a 69,000-seat stadium (approximately 1,860,000 gsf). Generally, the R&D Variant includes all uses proposed with the Project with the exception of the stadium area, which would be replaced by the additional R&D space. All characteristics of Candlestick Point would be the same as the Project; therefore, this analysis focuses on the changes that would occur at HPS Phase II. Potential construction-related environmental effects of the R&D Variant would be primarily related to an increase in the amount of total building space. Potential operational effects of the R&D Variant would be related to the day-to-day activities of the additional R&D space, which operates much like office use with increases in traffic, while avoiding the game-day traffic that would occur 12 times a year, and other event traffic that would occur 20 times a year, with a 49ers stadium.

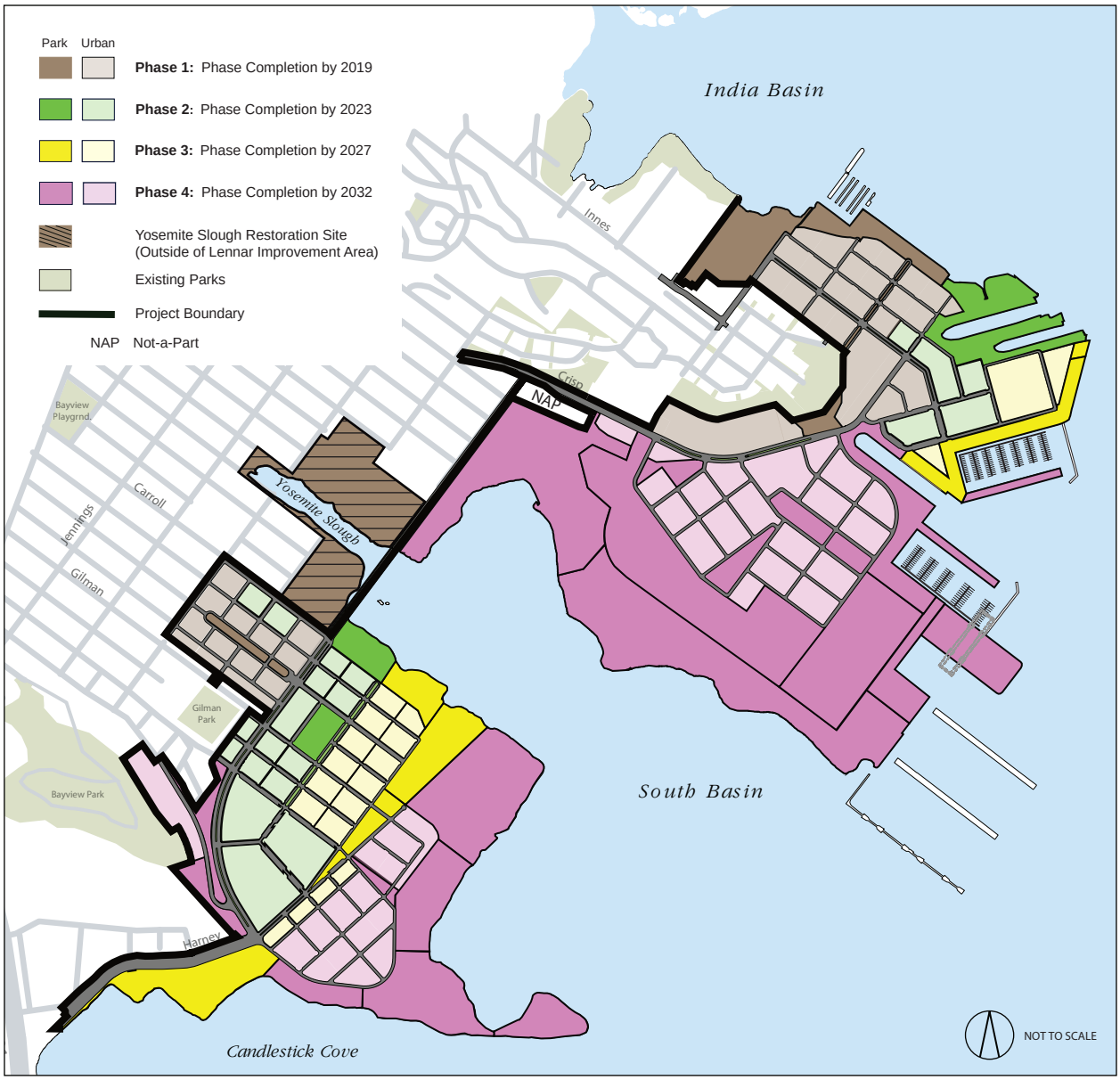
Land Use and Plans

As shown in Figure IV-1, the R&D Variant would replace the stadium proposed with the Project with an additional 2,500,000 square feet of R&D space, and a total net new gsf of 5,000,000. This would have the potential to increase land use impacts at the site as removal of the stadium from the land use program could conflict with existing applicable land use plans.

Division of an Established Community

The Project site generally includes underutilized and vacant parcels with limited access to the Bay shoreline and CPSRA. Connectivity between the Bayview Hunters Point neighborhood, Candlestick Point and HPS Phase II is limited. Large parking lots and vacant parcels at Candlestick Point separate the Bayview Hunters Point neighborhood from the Bay shoreline, and primary access roads do not include pedestrian, transit or bicycle features. Access to HPS Phase II is restricted to certain areas (those areas used for artist studios), and the area remains isolated from surrounding neighborhoods. The R&D Variant would maintain residential communities at Alice Griffith public housing and at Jamestown Avenue, similar to the Project.

- The R&D Variant (Variant 1) proposes infill development, centered on nodes of commercial and retail activity at Candlestick Point and HPS Phase II with no physical divisions. Residential and non-residential infill around these nodes of activity would provide a more continuous land use pattern and street grid, provide new services and community amenities in the Bayview Hunters Point neighborhood, allow better access to parks and recreational facilities (which would be improved under the R&D Variant [Variant 1]), and remove existing barriers to circulation and access. There are five blocks with privately owned parcels



SOURCE: Lennar Urban, 2010.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

FIGURE IV-4

R&D VARIANT (VARIANT 1)
BUILDING AND PARK CONSTRUCTION SCHEDULE

on Candlestick Point that the Applicant seeks to acquire for the development, including one on Jamestown Avenue in the Jamestown District (currently vacant) and four contiguous blocks in the Candlestick Point North District (currently vacant or developed with an RV park). If the private parcels are not acquired by the Applicant, they would be permitted under the BVHP Redevelopment Plan and the Planning Code to develop via an Owner Participation Agreement (OPA) in a manner that is consistent with the BVHP Redevelopment Plan or would be allowed to operate as an existing non-conforming use. For those parcels that are currently developed, or for any of the parcels if they develop via an OPA, that development would be included in the overall total development that would occur on the Project site. The total amount of development under this variant would not change; that is, the Applicant's development on the remaining portion of the site plus any development under separate OPAs as envisioned under the R&D Variant (Variant 1) would result in the same overall development level as proposed by the Applicant. The R&D Variant (Variant 1) would not divide an established community; therefore, no impact would occur, similar to the Project.

Consistency with Plans and Policies

Applicable plans that direct or regulate development on the Project site include the San Francisco General Plan, Candlestick Point State Recreation Area General Plan, San Francisco Bay Plan, San Francisco Bay Trail Plan, Bay Area Seaport Plan, Bayview Hunters Point Area Plan, Bayview Hunters Point Redevelopment Plan, Hunters Point Shipyard Redevelopment Plan, and San Francisco Planning Code. San Francisco's Sustainability Plan also applies to the Project. While the R&D Variant is generally consistent with goals and objectives of most plans, the R&D Variant would be inconsistent with land use designations that reflect former economic realities or former plans for the site. These inconsistencies would require amendments to the relevant plans, but do not reflect any impacts to the environment that the plans and policies seek to avoid. As described in connection with the Bay Plan and Seaport Plan, the designation of industrial uses along the waterfront is not a policy adopted to protect the environment, and the R&D Variant's proposals for this land represent an environmental improvement. Inconsistencies regarding the development pattern at HPS and the uses on Candlestick Point simply reflect the shifting locations of proposed uses within the site. As the primary change in land use compared to the Project would be no-stadium use, the R&D Variant's proposed changes in the arrangement of land uses would not implicate any environmental protection objectives of the current land use designations in the redevelopment plans and other applicable land use plans; thus, the inconsistencies do not give rise to a significant impact on the environment, similar to the Project.

Change to the Land Use Character

The R&D Variant would alter the land use character at the Project site with new development of residential uses, double the amount of R&D uses contemplated under the Project, regional and neighborhood retail uses, an arena, and public open space. The R&D Variant would extend the existing street grid and block pattern into HPS Phase II. The open space network would connect to the shoreline to the north and south.

This development would be considered to improve the existing land use conditions, and would not have an adverse effect on land use character of the Project site itself.

The R&D Variant would result in a substantially different built environment compared to the existing character of the site and vicinity. With the transition in scale and uses, the extension of the existing street

grid, and with the connectivity of new open space with existing shoreline open space, the R&D Variant would be compatible with surrounding land uses. In addition, the scale of development on the stadium site would be shorter with lower height limits than the 156-foot tall stadium building. The R&D Variant would not result in a substantial adverse change in the existing land use character at the Project site or vicinity. The impact would be less than significant, similar to the Project.

Population, Housing, and Employment

As shown in Figure IV-1, the R&D Variant would replace the football stadium proposed with the Project with an additional 2,500,000 square feet of R&D space. This would have the potential to increase employment opportunities at the site over levels anticipated with the Project, as discussed below (Table IV-6 [R&D Variant Employment by Land Use]). However, the permanent residential population would not change.

Direct Impacts

With the R&D Variant (Variant 1), construction is scheduled for completion beginning in the Year 2011, extending through the Year 2031, a period of approximately 20 years. This is similar to the construction schedule proposed at HPS Phase II; therefore, the number of construction personnel required at any given time at HPS Phase II would be similar to the total projected to be required for the Project. Construction employment opportunities are temporary in nature and would not result in a substantial increase in the number of employees in the area. Therefore, the R&D Variant would result in a less-than-significant impact to population during construction.

Direct population growth with the R&D Variant would include residents and employees who would occupy new homes. With the R&D Variant, the football stadium proposed with the Project would be replaced with 2,500,000 square feet of additional R&D space. There would be no change to the number of proposed housing units; therefore, compared to the Project, the permanent resident population with the R&D Variant would be the same as with the Project. The R&D Variant would generate additional jobs compared to the Project. As discussed in Section III.C (Population, Housing, and Employment), the stadium is anticipated to generate approximately 359 jobs for 12 football games and 20 other events at the stadium. The R&D Variant would generate an additional approximately 6,250 jobs at HPS Phase II, which would result in a net increase of approximately 5,905 jobs over the Project. This net increase with the Variant would represent approximately 0.8 percent of the 748,100 jobs anticipated citywide in 2030; the total number of jobs with the R&D Variant would be about 2.2 percent of the total number of jobs citywide in 2030.

Although the R&D Variant would result in an increase in employment at the HPS Phase II site, growth in this area has long been the subject of many planning activities. The R&D Variant would provide all on-site infrastructure for connections to City mains, and would include on-site treatment of stormwater runoff. Therefore, the R&D development would not encourage growth where appropriate infrastructure would not be available.

Table IV-6 R&D Variant Employment by Land Use

Land Use	*Employment Factor*[a]	*Development Program, Candlestick Point*[b]	*Employment, Candlestick Point (jobs)*	*Development Program, HPS Phase II*[b]	*Employment, HPS Phase II (jobs)*	*Total Employment (jobs)*
Residential	25 units/job	7,850 units	314	2,650 units	106	420
Regional Retail	350 gsf/job	635,000 gsf	1,814	0 gsf	—	1,814
Neighborhood Retail	270 gsf/job	125,000 gsf	463	125,000 gsf	463	926
Office	276 gsf/job	150,000 gsf	543	0 gsf	—	543
Research and Development	400 gsf/job	0 gsf	—	5,000,000 gsf	12,500	12,500
Hotel	700 gsf/job	150,000 gsf	214	0 gsf	—	214
Arena/Performance Venue	300 jobs/event[c]	150 events/year[c]	87	0 events	—	87
Public Parking	270 spaces/job[e]	3,706[e]	14	8,706 [e]	32	46
Parks and Open Space	0.26 jobs/acre[f]	104.8[g]	27	222.2[g]	58	85
Total			***3,476***		***13,159***	***16,635***
Project Total						***10,730***

SOURCES: Economic and Planning Systems, Inc., *Fiscal Analysis of the Candlestick Point/Hunters Point Shipyard Redevelopment Project*, 2009.

a. Employment factors are from City and County of San Francisco, *Transportation Impact Analysis Guidelines*, October 2002.

b. Based on buildout floor areas provided in Table II-2 of this EIR, Chapter II for Candlestick Point, and on Table IV3 for HPS Phase II.

c. Lennar Urban, LLC estimates that there would be approximately 150 events at the arena annually and that employees would work 4-hour shifts.

d. Employment factors for public parking facilities provided by Economic and Planning Systems, Inc., 2009.

e. Parking based on Table IV-3 of this EIR, Chapter II. Includes Commercial (structured) and General and Commercial (on street). Commercial and on-street parking at HPS Phase II would be increased compared to the Project to provide parking for the additional R&D space.

f. Employment factors for parks and open space provided by Economic and Planning Systems, Inc., 2009.

g. Open space acreages based on Table II-2 of this EIR, Chapter II for Candlestick Point, and on Table IV-4 for HPS Phase II.

Employment growth at HPS Phase II would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. The R&D Variant would not alter the number of housing units proposed with the Project. Based on the total employment available with the R&D Variant (16,635 jobs), total housing demand would be approximately 12,807 units.[1196] Total demand for housing with the R&D Variant would represent 6.0 percent of the total Bay Area housing need of 214,500 units (based on the Regional Housing Needs Assessment (RHNA) targets; refer to Section III.C.3 [Regulatory Framework]) projected by ABAG through 2014.[1197] Based on the total employment available with the R&D Variant (16,635 jobs), total housing demand would be approximately 12,807 units. However, as discussed in Section III.C, approximately 55 percent of the workers would seek housing in the City, consistent with existing commuting patterns.[1198] As such, approximately 7,044 dwelling units would be required with the R&D Variant to meet the demand by anticipated employees. As discussed above, the R&D Variant would provide approximately 10,500 dwelling units. This would exceed the approximately 7,044 dwelling unit demand anticipated with the R&D Variant. Therefore, the population increase associated with employment with the R&D Variant could be entirely accommodated. However, it is likely that some employees with the R&D Variant would elect to live elsewhere in the City or within surrounding Bay Area communities. Based on existing commuting patterns, the R&D Variant would generate a demand for about 5,763 units in surrounding Bay Area communities. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that the increase in employment with the R&D Variant would create a substantial demand for housing in the immediate neighborhood, in San Francisco, or in the region in excess of the housing provided as part of the R&D Variant or housing otherwise available in the Bay Area. Necessary improvements to infrastructure, public services, and housing associated with direct population growth proposed as part of the R&D Variant has been anticipated in ongoing local and regional planning activities. All impacts associated with direct population growth are considered less than significant, similar to the Project.

Indirect Impacts

As infrastructure, public services, roads, and other services and communities amenities are expanded, there would also be potential for development with the R&D Variant to generate indirect population growth. Indirect growth is often defined as "leapfrog" development, development that occurs as infrastructure is expanded to previously un-served areas. Such development patterns usually occur in suburban areas adjacent to undeveloped lands. Areas surrounding the R&D Variant site are built out, except for sites such as Executive Park or India Basin that are currently undergoing development or are the subject of planned future development. Thus, the surrounding lands are not vulnerable to leapfrog-type development.

[1196] Calculated as the projected employment divided by 1.36, plus 4.7% additional housing units to account for vacancy rate, times 55% total demand in San Francisco.
[1197] The RHNP is updated every five years and does not extend through 2030.
[1198] This assumption provides a conservative estimate of the housing demand that the Project would generate in other Bay Area communities, such as nearby cities in San Mateo County. Information pertaining to commuting trends was derived from US Department of Transportation, *Census 2000 Transportation Planning Package*, 2006.

Infrastructure and services would be expanded to serve both the Candlestick Point and HPS Phase II sites, without significant excess capacity that might encourage additional local growth beyond that already anticipated with Proposition G and with the redevelopment plans. Development with the R&D Variant would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. All impacts associated with indirect population growth are considered less than significant, similar to the Project.

The potential for impacts due to housing displacement would be substantially similar to the Project. No housing or residents would be displaced. There would be no impact, the same as under the Project. The R&D Variant would not increase residential units proposed with the Project.

Transportation and Circulation

The R&D Variant (Variant 1) would increase the total amount of development compared to the Project with an increase in R&D space at HPS Phase II of 2,500,000 gsf; there would be no 69,000-seat football stadium. Therefore, the R&D Variant would not have game day or other stadium event transportation impacts associated with the Project. The R&D Variant (Variant 1) would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with the Project, including the Yosemite Slough bridge. However, the bridge would be narrower than the bridge with the Project, with a 39-foot-wide right-of-way to accommodate two 11-foot-wide BRT lanes, a sidewalk, and a Class I bicycle path. At HPS Phase II, this variant would have additional roadways to serve the R&D uses at HPS South and commercial parking would be increased to serve the additional R&D space, compared to the Project.

The R&D Variant would include a Transportation System Management plan and would develop and implement a Transportation Demand Management plan, as with the Project.

The Transportation Study analyzed the R&D Variant and conclusions from the Transportation Study are presented below.

Construction Impacts

Construction activities associated with the R&D Variant would be similar to the Project. Depending on the phasing of the additional development, the R&D Variant may result in fewer construction traffic impacts between future years 2012 and 2017 when the new stadium would be constructed, and somewhat greater impacts in the years the additional R&D space would be constructed. Implementation of a Construction Traffic Management Program (the same as described for the Project) would help minimize the R&D Variant's contribution to cumulative construction-related traffic impacts. However, since some disruption and increased delays could still occur even with implementation of traffic control plans, it is possible that significant construction-related traffic impacts on local and regional roadways could still occur. Localized construction-related traffic impacts would therefore remain significant and unavoidable.

Trip Generation

The R&D Variant would have 236,291 total daily person trips and would generate 16,253 weekday AM trips, 22,586 weekday PM trips, and 19,719 Sunday PM trips. The total trips would be greater than the Project trips.

Intersection Conditions

- With the R&D Variant (Variant 1), 44 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. Development associated with the R&D Variant (Variant 1) would result in significant unavoidable impacts at 31 intersections, six more than for the Project. The R&D Variant would have similar project and cumulative effects at most study intersections as would occur with the Project. Section III.D, discusses traffic effects those intersections, and the feasibility of mitigation measures. As noted in Impact TR-3, Impact TR-4, Impact TR-5, Impact TR-6, and Impact TR-8, Project intersection impacts, including cumulative impacts, would remain significant and unavoidable. Those conclusions would apply as well to the R&D Variant. At six locations, the R&D Variant (Variant 1) would have significant project-level or cumulative effects on intersection conditions that would not occur with the Project. As discussed below, at four of the six intersections, the R&D Variant (Variant 1) impacts would be significant and unavoidable, and at two of the six intersections (Crisp/Palou and Innes/Earl), the impacts would be less than significant with mitigation.

  The intersection of Crisp/Palou is currently un-signalized, but would be signalized with implementation of the R&D Variant (and the Project). With the R&D Variant, the intersection of Crisp/Palou would worsen in the AM and PM peak hours from LOS E with 2030 No Project conditions to LOS F with the R&D Variant.

  Striping the southbound approach to provide a dedicated left-turn lane and a shared through/right-turn lane, and prohibiting on-street parking on Griffith Street between Palou Avenue and Oakdale Avenue would result in an LOS D at the intersection. Implementation of this improvement would be the responsibility of SFMTA and DPW, the Project Applicant shall contribute its fair-share toward construction of this mitigation measure. Prior to payment of the contribution, the City shall create a mechanism to determine and receive fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary.

  With implementation of this measure, the Crisp/Palou intersection would operate at acceptable LOS D or better in the AM and PM peak hours, and therefore R&D Variant and cumulative impacts at this intersection would be less than significant.

  The intersection of Ingalls/Carroll is un-signalized, but would be signalized with implementation of the R&D Variant. The intersection of Ingalls/Carroll would worsen in the PM peak hour from LOS C under year 2030 No Project conditions to LOS E with the R&D Variant. The degradation in level of service at this intersection would primarily be due to heavy increases in traffic on Ingalls Street, particularly in the southbound direction in the PM peak hour. Ingalls Street would serve as the most direct auto traffic route for traffic from the Hunters Point Shipyard site destined for Candlestick Point and US-101. Therefore, it would experience substantial traffic increases as part of the R&D Variant.

  To accommodate additional right-of-way needed for additional lanes on southbound Ingalls, Ingalls Street would need to be widened to the east and west. This would require prohibition of on-street parking, which the industrial businesses on this section of Ingalls Street use for loading and unloading, or would require substantial narrowing of the sidewalks. Narrowing of sidewalks would create longer pedestrian crossing distances, and would require more pedestrian crossing time as part of a signal phasing plan. Because widening Ingalls Street would worsen pedestrian conditions, this mitigation was considered infeasible. Alternatively, a

mitigation measure that reduced travel demand on Ingalls Street by providing an alternate route, such as the Yosemite Slough bridge, would improve operations at this intersection. The proposed new bridge across Yosemite Slough would accommodate four lanes of traffic on game days only plus two transit-only lanes, open at all times, under the Project scenario. However, allowing traffic on the Yosemite Slough bridge at all times would have potential secondary impacts to Yosemite Slough associated with noise, air quality, and visual impacts, and would be inconsistent with the overall character of the Yosemite Slough restoration. Therefore, opening the Yosemite Slough bridge to regular traffic was not considered further.

Since widening Ingalls Street and providing an alternate traffic route via the Yosemite Slough bridge would not be feasible, R&D Variant-related and cumulative impacts at this intersection would be significant and unavoidable.

At the signalized intersection of Bayshore/Oakdale, the intersection operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with the R&D Variant. The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Mitigation for this impact would involve increasing capacity on Bayshore Boulevard. There is inadequate right-of-way to provide additional lanes on Bayshore Boulevard without widening the roadway. Roadway widening would require major right-of-way acquisition along the entire Bayshore Boulevard corridor, at substantial cost and displacement of existing homes and businesses. R&D Variant and cumulative impacts at this intersection would be significant and unavoidable.

At the un-signalized intersection of Innes/Earl, operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with the R&D Variant, and traffic signal warrants would be met. The intersection is proposed as a side street STOP sign controlled intersection, with movements along Innes Avenue uncontrolled and movements on southbound Earl Street controlled by a STOP sign. The degradation in level of service would be primarily due to large increases in traffic along Innes Avenue. The high traffic volumes on Innes Avenue would cause additional delay for traffic attempting to exit Earl Street, which is assumed to provide a single lane to accommodate both southbound right-turns and southbound left-turns onto Innes. The R&D Variant would result in higher volumes of traffic along Innes Avenue than the Project, therefore creating higher delays for southbound traffic on Earl Street.

Installing a traffic signal at the intersection of Innes/Earl would improve intersection operations to LOS D or better conditions. This intersection would be close to meeting peak-hour traffic signal warrants with build-out of the R&D Variant. The Project Applicant, in collaboration with the City, shall monitor traffic volumes as the Project builds out to determine whether the intersection volumes would actually warrant a traffic signal. Based on the monitoring, if the City determines a traffic signal is warranted, the Project Applicant shall be required to install a traffic signal as part of later development phases.

Implementation of this improvement would be the responsibility of SFMTA, and should be implemented when traffic conditions worsen to unacceptable levels. Since this mitigation has also been identified as needed for 2030 No Project conditions, the Project Applicant shall contribute its fair-share toward construction of this mitigation measure. Prior to payment of the contribution, the City shall create a mechanism to determine and receive fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary.

With implementation of the signalization, R&D Variant and cumulative impacts at the Innes/Earl intersection would be less than significant.

With the R&D Variant, the Evans/Jennings intersection would be signalized and restriped to accommodate the future travel patterns, and the intersection would operate at LOS E in the AM peak hour, and the R&D Variant would contribute considerably to the poor operating conditions. Additional capacity would be required in the eastbound and southbound directions to accommodate the additional vehicles generated by the R&D Variant. Additional lanes would require substantial right-of-way acquisition to the north or south of Evans Avenue, and on Jennings Street. Right-of-way acquisition is not considered feasible, and therefore, R&D Variant-related and cumulative impacts at Evans/Jennings would be significant and unavoidable.

Traffic spillover effects with the R&D Variant would be significant and unavoidable, as with the Project.

- At the signalized intersection of Cesar Chavez/Evans, the R&D Variant (Variant 1) would contribute significantly to cumulative impacts identified for the 2030 No Project conditions. The Transportation Study (Appendix D) explains in the 2030 No Project analysis, that the Hunters Point Shipyard Redevelopment Plan FEIR identified a mitigation measure at this intersection that involved a reconfiguration of the northbound approach of Evans Avenue to Cesar Chavez Street to provide exclusive northbound left and right turn lanes, and changing the signal timing plan to include the exclusive left turn and right turn movements. The measure identified that the northeast corner curb return would require structural modifications to the existing viaduct. DPW, as part of the BTI Project analysis, determined that widening of the existing structure supporting the intersection of Evans Avenue and Cesar Chavez Street is not feasible. The R&D Variant (Variant 1) and cumulative impacts at this intersection would be significant and unavoidable.

Freeway Conditions

The R&D Variant effects on freeway mainline sections would be similar to the Project, although the magnitude of impacts may be greater with the R&D Variant due to increased traffic generation compared to the Project. The R&D Variant would cause the mainline section of US-101 northbound from Sierra Point to Alana/Harney/Geneva to deteriorate from LOS E to LOS F in the AM peak hour. This would be an additional significant impact associated with the R&D Variant. However, no feasible mitigation measures have been identified for the freeway segments expected to experience significant impacts with 2030 No Project conditions or with the Project. Therefore, the R&D Variant-related and cumulative effects freeway operating conditions on this segment would be considered significant and unavoidable.

The R&D Variant effects on freeway ramp junctions would be similar to the Project, although the magnitude of impacts may be greater with the R&D Variant due to increased traffic generation compared to the Project. As described for Project impacts, no feasible mitigation measures have been identified for future freeway ramp junction conditions. Therefore, the R&D Variant contribution to freeway ramp operating conditions would be considered significant and unavoidable.

The R&D Variant ramp queuing effects would be similar to Project effects. The R&D Variant would result in significant impacts with respect to ramp queuing at the same off-ramp locations as the Project, with one exception. With the R&D Variant, the US-101 northbound off-ramp to Harney Way would not be likely

to experience queues extending back to the mainline in the PM peak hour. However, the R&D Variant's contribution to other impacts associated with queuing would be the same as the Project. As described for Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant impacts. Therefore, the R&D Variant's contribution to freeway segments operating at LOS E or LOS F conditions would be considered significant and unavoidable.

Transit Impacts

The R&D Variant, as with the Project, would include extended and new transit services; transit trips with the R&D Variant would be accommodated within the capacity of these services. The R&D Variant, as with the Project, would have a less than significant impact with mitigation on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with the R&D Variant would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. Project mitigation measures MM TR-21 to MM TR-30 would also apply to the R&D Variant, but as concluded in Section III.D, the feasibility or implementation of the measures is uncertain, and the transit delay effects would remain significant and unavoidable.

The R&D Variant would require additional vehicles on the same routes as the Project. During the PM peak hour, the R&D Variant would require additional vehicles on the same routes as the Project; the R&D Variant would require additional vehicles on the 48-Quintara. Impacts associated with the R&D Variant would be more extensive than those for the Project, and would be significant and unavoidable.

Bicycle Impacts

The R&D Variant bicycle trips would be accommodated within the proposed street and network, and impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The R&D Variant would be accommodated within the proposed sidewalk and pedestrian network, and impacts on pedestrian circulation would be less than significant.

Parking Impacts

The R&D Variant would result in a demand for about 25,165 spaces, compared with a maximum permitted supply of about 19,874 spaces; therefore, the maximum off-street parking supply would be about 5,290 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. Due to parking supply constraints and accessibility to transit, future R&D Variant parking demand may be somewhat lower than estimated, and therefore the parking space shortfall would also be less than the number of spaces that would be required in order to accommodate all the vehicles anticipated if the proposed parking supply was unconstrained. Since the parking supply would be constrained, the actual parking demand would be expected to be less. As discussed in Section III.D, peak parking demand would not represent do not occur simultaneously; public parking facilities, such as the one proposed in Candlestick Point, and on-street parking spaces can usually be shared efficiently among many destinations; and the R&D Variant would include a Travel Demand Management program that includes a number of parking strategies to make auto use and ownership less attractive, as well as strategies to encourage alternative modes.

As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. Parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact under CEQA, but rather a social effect. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and R&D Variants impacts on parking would be less than significant.

The R&D Variant would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

- ***Arena Impacts***

The R&D Variant (Variant 1) would have the same arena-related transportation effects as with the Project, that is, significant and unavoidable impacts on traffic and transit operations, except the impact to transit operations would be caused by traffic congestion (as for the Project) and by possibly added transit demand. Since the amount of background transit demand under the R&D Variant (Variant 1) would be higher than the Project, it is possible that the added transit demand associated with a sold-out arena event would create demand for transit service greater than the capacity of the transit supply to the arena. This possible effect would be reduced by having SFMTA increase the frequency on regularly scheduled Muni routes (primarily the CPX-Candlestick Express) serving the arena area prior to large events at the arena. Additional shuttle service provided by the arena operator to key regional transit destinations, such as BART, Caltrain, and the T-Third light rail route would also reduce this possible effect, but as for the Project, even with this mitigation and the mitigation identified for the Project to address impacts on transit operations, MM TR-23.1 (Maintain proposed headways for the 29 Sunset), the impact on transit operations would, like the Project, remain significant and unavoidable. Likewise, impacts on traffic, as for the Project, would be reduced but not avoided with implementation of mitigation measure MM TR-41 (Transportation Management Plan for the arena).

Aesthetics

As shown in Figure IV-1, the R&D Variant would replace the 49ers stadium proposed with the Project with an additional 2,500,000 gsf of R&D space. Construction impacts would be substantially similar to the Project. Operational impacts would be similar but less than those identified with the Project, as the proposed R&D buildings would be lower in height than the stadium. All other urban design and building forms with the R&D Variant, and resulting effects, would be similar to conditions with the Project.

Construction

- As noted above, construction impacts of the R&D Variant (Variant 1) on the visual character of the area would be similar to the Project, except that the R&D uses would be constructed by 2031, later than the

2017 construction of the Project stadium. This would not change the significance of impacts. Construction activities would occur throughout the 702-acre R&D Variant (Variant 1) site over the approximately 20-year build-out period, ending in 2031. Visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. In addition, temporary structures could be located on the site during various stages of demolition or construction, within materials storage areas, or associated with construction debris piles on and off site. Exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates would be visible for the proposed utilities and infrastructure improvements, as well as for roadway improvements. Although these activities would take place primarily within the R&D Variant site, they would be visible to surrounding land uses. However, these visual conditions would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Further, temporary conditions (e.g., bulldozers, trenching equipment, generators, trucks, etc.) associated with construction would not result in obstruction of a scenic vista, as construction equipment is not tall enough to interfere with views of the Bay, the East Bay hills, or the San Francisco downtown skyline. The R&D Variant site is not located within a state scenic highway. The only scenic resources on or near the site are the CPSRA, the Re-gunning crane, Yosemite Slough, the shoreline, the Bay, San Bruno Mountain, and Bayview Hill. There are no rock outcroppings or major areas of landscaping on the site, although some ruderal vegetation would be removed. Construction of the R&D Variant would not affect the Re-gunning crane, which would remain intact after implementation of the R&D Variant. Therefore, construction activities would have a less-than-significant impact on scenic vistas and scenic resources, similar to the Project. Mitigation measure MM AE-2 (Mitigation for Visual Character/Quality Impacts during Construction) would further reduce potential impacts to the visual character of the area.

Construction impacts of the R&D Variant to light and glare would be similar to the Project. Construction would occur during daylight hours, generally between 7:00 A.M. and 8:00 P.M. or as otherwise allowed by the City. A minimal amount of glare could result from reflection of sunlight off windows of trucks, but this would be negligible and would not affect daytime views in the area. Security lighting would be provided after hours on all construction sites, but this lighting would be minimal, restricted to the R&D Variant site, and would not exceed the level of existing night lighting levels in urban areas. In addition, construction lighting would comply with any City of San Francisco lighting requirements. Therefore, construction activities would have a less-than-significant impact due to light and glare.

Operation

Operational impacts to views would be substantially similar to the impacts of the Project. Development at Candlestick Point would remain the same as with the Project and impacts would be the same as identified with the Project. With the R&D Variant, the football stadium proposed with the Project would be replaced with 2,500,000 square feet of additional R&D space at the HPS Phase II site (Figure IV-5 [R&D Variant Northeast from CPSRA]). The proposed 69,000-seat 49ers football stadium would be approximately 156 feet tall (about 15 stories) above the adjacent playing field. In contrast, buildings constructed as part of the R&D development would range in height from 40 feet to 65 feet, a minimum of approximately 90 feet below the heights proposed with the Project. The area surrounding the additional R&D space would be developed with new open space to the west, south, and east, and by new R&D uses to the north. With respect to adjacent neighborhoods, the HPS Phase II North district would be south of the India

Basin neighborhood (Figure IV-6 [R&D Variant South from Hilltop Open Space]). Therefore, development with the R&D Variant would result in a less-than-significant impact due to obstruction of a view or scenic vista, similar to the Project.

Development of the R&D Variant would have substantially similar impacts to the Project regarding the potential for damaging scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting because design of the proposed R&D buildings would be of appropriate height, massing, and architectural treatment. The R&D Variant would replace the development program of the football stadium proposed with the Project with 2,500,000 square feet of additional R&D space. Development at Candlestick Point would remain the same as with the Project and impacts would be the same as identified with the Project. At the HPS Phase II site, the R&D Variant would continue to remove old, deteriorating structures associated with ship repair, piers, dry-docks, storage, and administrative uses and replace these structures with new development. Currently, HPS Phase II contains limited landscaping and is primarily a degraded industrial setting. Bayview Hill is a prominent scenic resource on the site and would remain intact with the R&D Variant development with the exception of close-in vantage points, which may be altered. The R&D Variant site is not located within a state scenic highway. The R&D Variant would retain structures at the potential HPS Drydock Historic District, as well as the Re-gunning crane, a highly visible visual reference point. Development of the HPS Phase II site with the R&D Variant would also include about 327 acres of new and renovated parkland, open space, and sports fields, with improved public access, thereby improving the scenic quality of the area (this is 9.4 fewer acres than the Project would provide). Therefore, development at the HPS Phase II site would not have significant adverse impacts on scenic resources or other features that contribute to a scenic public setting, and the impact would be less than significant. Additionally, the R&D Variant development would not substantially degrade the visual quality or character of the R&D Variant site or its surroundings and the impact would be less than significant.

The R&D Variant would not include the field lighting and other nighttime lighting associated with the 49ers stadium. The Variant would have way-finding, security, and street lighting associated with R&D uses and other development at HPS Phase II. The R&D Variant would not interfere with any existing views of the night sky from across the Bay, nor would glare affect these views, similar to the Project. New sources of light associated with neighborhood retail use during the evening and residential uses at night could result from the R&D Variant, similar to the Project. Impacts of the R&D Variant would be slightly less than the Project due to the elimination of the stadium, and would result in a less-than-significant impact with incorporation of mitigation measures MM AE-7a.1 (parking lot lighting), MM AE-7a.2 (landscape and sign illumination), MM AE-7a.3 (lighting plan), and MM AE-7a.4 (nonreflective materials).



Existing



Proposed

SOURCE: Lennar Urban, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE IV-5

Candlestick Point — Hunters Point Shipyard Phase II EIR

R&D VARIANT NORTHEAST FROM CPSRA





SOURCE: Lennar Urban, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE IV-6

Candlestick Point — Hunters Point Shipyard Phase II EIR

R&D VARIANT SOUTH FROM HILLTOP OPEN SPACE

Shadows

As shown in Figure IV-1 (R&D Variant Land Use Plan), the R&D Variant would replace the football stadium proposed under the Project with an additional 2,500,000 square feet of R&D space. Operational impacts would be similar to those identified under the Project, although shade impacts would be slightly less, as the proposed R&D buildings would be lower in height than the stadium.

Construction

As with the Project, construction activities of the R&D Variant would not result in shadow effects on open space.

Operation

For the R&D Variant, development at Candlestick Point would be the same as the Project. Thus although development at Candlestick Point would result in new structures with the potential to cast shadows on existing or proposed parks and open space, shadows would not substantially affect outdoor recreation facilities or other public areas and impacts would be less than significant, same as the Project.

As shown in Figure IV-2, the R&D Variant would develop buildings up to 65 feet high in the Hunters Point Shipyard South district, compared to the 49ers stadium up to 156 feet high with the Project. All other land use and building heights in the Hunters Point Shipyard North, Hunters Point Shipyard Village Center, and the R&D districts would be the same as with the Project. Overall, shadow effects of the R&D Variant at HPS Phase II would be similar to effects with the Project.

HPS Phase II would include new open space at Grasslands Ecology Park, Sports Fields, and Multi-Use Lawn at Hunters Point Shipyard South, the Waterfront Recreation Pier, the Waterfront Promenade, Heritage Park, and Northside Park. The R&D Variant would have a different configuration of open space at Hunters Point Shipyard South than the Project. Refer to Figure IV-1.

As the building heights and land uses at Hunters Point Shipyard North, Hunters Point Shipyard Village Center, and the R&D districts would be the same for the R&D Variant as the Project, development at those locations would not add shade year round to existing public open space, including India Basin Shoreline Park and India Basin Open Space.

During morning and mid-day periods from September through March, the R&D Variant would have similar shading effects as the Project, on Grasslands Ecology Park near Crisp Road, Heritage Park, and Hillside Parks and Open Space. In mid-afternoon, the Variant would shade the Waterfront Promenade. During summer months, the R&D Variant Shade effects would be similar to the Project, with shade on Grasslands Ecology Park near Crisp Road, Heritage Park, and Hillside Open Space. Although the R&D Variant would cast shadows on recreational and open space, it would not substantially affect outdoor recreation facilities or other public areas or have an adverse effect on the use of the open space and impacts would be less than significant, similar to the Project.

Wind

As shown in Figure IV-2, the R&D Variant would replace the 156-foot tall football stadium with 40- and 65-foot-tall R&D buildings, substantially less than the 100-foot height threshold at which wind impacts are anticipated.

Construction

Construction activities of the R&D Variant would not result in additional wind impacts, similar to the Project. Impacts such as fugitive dust emissions and erosion from wind are addressed in Section III.H (Air Quality) and Section III.M (Hydrology and Water Quality).

Operation

Building structures near or greater than 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 mph equivalent wind speed for a single hour of the year would be exceeded. There is no threshold height that triggers the need for wind tunnel testing to determine whether the building design would result in street-level winds that exceed the standard. It is generally understood, however, from wind tunnel testing on a variety of projects in San Francisco, that most, if not all, buildings under 100 feet do not result in adverse wind effects at street level barring unusual circumstances.

For the R&D Variant, development at Candlestick Point would be the same as the Project. Thus development at Candlestick Point would result in new structures with the potential generate winds that could affect ground-level pedestrian spaces. Implementation of mitigation measure MM W-1a (Building Design Wind Analysis), which would require a design review process for buildings greater than 100 feet in height, and if determined to be necessary, inclusion of a design criteria to reduce pedestrian-level impacts, would reduce impacts to a less than significant level, similar to the project.

Development at HPS Phase II would replace the 156 high football stadium with R&D buildings with heights of 65 and 40 feet, which is less than the 100-foot height threshold at which buildings could generate winds that could affect ground-level pedestrian spaces. Thus, with the reduction in building heights, impacts at HPS Phase II would be less than significant. As the additional R&D uses would not exceed 100 feet in height and would not result in adverse wind effects, impacts would be less than the Project.

Air Quality

As shown in Table IV-1, the R&D Variant would replace the 49ers stadium proposed with the Project with an additional 2,500,000 gsf of R&D space (total R&D uses would equal 5,000,000 gsf). Construction impacts would be substantially similar to the Project. Operational impacts would be similar but greater than those identified under the Project as the proposed additional R&D development would result in greater daily criteria pollutant emissions than the stadium.

Construction

As stated above, overall construction impacts of the R&D Variant (Variant 1) with respect to air quality would be similar to the Project. Construction activities would occur throughout the 702-acre R&D Variant (Variant 1) site over the approximately 20-year build-out period ending in 2031, with the construction of

the additional R&D facilities occurring between 2018 and 2031. Similar to the Project, construction activities under the R&D Variant would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures, use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

With respect to construction emissions, construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. However, the BAAQMD does not recommend any significance thresholds for the emissions during construction. Instead, the BAAQMD bases the criteria on a consideration of the mitigation measures to be implemented. If all appropriate emissions mitigation measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, construction emissions are not considered adverse. Fine particulate matter (PM_{10}) is the pollutant of greatest concern with respect to construction activities.[1199] Any project within the City of San Francisco, including the R&D Variant, would be required to comply with *San Francisco Health Code* Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). As such, with implementation of mitigation MM HZ-15, which identifies specific mitigation measures that would be used to reduce emissions associated with construction, impacts would be less than significant, similar to the Project.

With respect to airborne human health risks, construction activities associated with the R&D Variant would increase the levels of two potential human health risks: (1) diesel particulate matter (DPM) and (2) dust or particulate matter (PM_{10}) bound to certain metals and/or organic compounds from on-site soils. MM AQ-2.1 (Implement Accelerated Emission Control Device Installation on Construction Equipment) and MM AQ-2.2 (Implement Accelerated Emission Control Device Installation on Construction Equipment Used for Alice Griffith Parcels) would address construction sources of DPM including off-road construction equipment such as lifts, loaders, excavators, dozers, and graders. In addition, the delivery of equipment and construction materials, spoils and debris hauling, and employee commute traffic could contribute to construction-related DPM emissions. In terms of DPM, ENVIRON prepared a human health risk assessment (HRA)[1200] that evaluated potential human health risks associated with construction and operation of the Project quantitatively and the proposed variants qualitatively, including the R&D Variant. As construction emissions associated with the R&D Variant are expected to be lower than those associated with construction of a stadium in the same location (e.g., Project), the R&D Variant would have lower impacts than the Project.

The HRA evaluated potential impacts to numerous receptors (off-site residents, off-site workers, off-site students, and on-site residents) in and around the Project. BAAQMD CEQA Guidelines have an

[1199] BAAQMD. 1999. *BAAQMD CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*. December.
[1200] Environ. 2009. Ambient Air Quality Human Health Risk Assessment: Candlestick Point – Hunters Point Shipyard Phase II Development Plan. September 28. Appendices I & II of the report.

established threshold of 10 in one million for carcinogenic health risks; the HRA concluded that the inhalation cancer risk at the MEI would be 4.5 in one million. This represents the maximum level of DPM experienced by all off-site and on-site (i.e., Alice Griffith) sensitive receptors during Project construction activities. Exposure to DPM from construction activities associated with the Project would not exceed the threshold. The R&D Variant is not anticipated to exceed Project impacts and therefore would not exceed the BAAQMD CEQA threshold. In addition, the HRA concluded the maximum chronic noncancer HI to be 0.01, which is below the BAAQMD's significance threshold of 1.0.

As the carcinogenic and non-carcinogenic health risks posed by DPM emissions during construction activities associated with development of the R&D Variant have been determined to be below established thresholds, this impact is less than significant with MM AQ-2.1 and MM AQ-2.2, similar to the Project.

Similar to the Project, construction activities at both Candlestick Point and HPS Phase II for the R&D Variant have the potential to generate TACs associated with soil-PM_{10} and an HRA evaluated the potential concentrations of the airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult and child residents, workers, and schoolchildren) in the Project vicinity. As the carcinogenic and noncarcinogenic health risks posed by soil-PM_{10} emissions during construction activities associated with development of the Project have been determined to be below established thresholds, the same impacts would be expected from the R&D Variant. This impact is less than significant with MM HZ-15, similar to the Project.

Operation

Operational impacts to regional and local air quality would be substantially similar to the Project. Development at Candlestick Point would remain the same as under the Project and impacts would be the same as identified under the Project. Under the R&D Variant, the football stadium proposed under the Project would be replaced with 2,500,000 square feet of additional R&D space at the HPS Phase II site. Due to the additional vehicular trips associated with the increased amount of R&D uses under this variant, the level of emissions anticipated under the R&D Variant would be greater than the Project, as shown in Table IV-7 (R&D Variant [Variant 1] Operational Criteria Pollutant Emissions [Year 2032]). The difference in daily criteria pollutants would increase under the R&D Variant compared to the Project by 6 to 12 percent.

However, both the R&D Variant and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. The R&D Variant, similar to the Project, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. The R&D Variant's transportation analysis estimates that a similar R&D development that did not include the trip reduction features of the R&D Variant would generate 147,682 daily external motor vehicle trips (about 71 percent more than the R&D Variant's daily external motor vehicle trips). The comparison of the R&D Variant to a similar level of development under "business as usual" conditions is also shown in Table IV-7.

Table IV-7 R&D Variant (Variant 1) Operational Criteria Pollutant Emissions (Year 2032)

Scenario/Emission Source	*ROG (lbs/day)*	*NO_X (lbs/day)*	*CO (lbs/day)*	*PM_{10} (lbs/day)*	*$PM_{2.5}$ (lbs/day)*
Hunters Point Shipyard					
Area[a]	182	55	44	1	1
Motor Vehicles (External)	119	109	1,247	576	108
Subtotal	*302*	*164*	*1,291*	*578*	*110*
Candlestick Point					
Area[a]	449	70	53	4	4
Motor Vehicles (External)	216	195	2,221	1,025	193
Subtotal	*665*	*265*	*2,274*	*1,028*	*196*
All Development Sites					
Area[a]	631	125	97	5	5
Motor Vehicles (External)	335	304	3,468	1,601	301
Motor Vehicles (Internal)	30	13	228	45	9
All Sources (R&D Variant)	***997***	***442***	***3,793***	***1,650***	***315***
Comparison to Proposed Project	***106%***	***112%***	***111%***	***111%***	***111%***
Change from Proposed Project	*6%*	*12%*	*11%*	*11%*	*11%*
Comparison to Business as Usual	***89%***	***74%***	***70%***	***64%***	***65%***
Reduction from Business as Usual	*-11%*	*-26%*	*-30%*	*-36%*	*-35%*
All Development Sites (Business as Usual)					
Area[a]	631	125	97	5	5
Motor Vehicles	485	476	5,292	2,561	481
All Sources (Business as Usual)	***1,117***	***601***	***5,389***	***2,566***	***486***
Comparison to R&D Variant	***112%***	***136%***	***142%***	***155%***	***154%***

SOURCE: PBS&J, 2009. Based on URBEMIS 2007 Version 9.2.4.

Daily emissions of ROG and NO_X were calculated under Summer conditions when ambient ozone concentrations are highest. Daily emissions of CO, PM_{10}, and $PM_{2.5}$ were calculated under winter conditions when associated ambient concentrations are highest.

* Area emissions are from sources located on the project site, such as natural gas combustion for heating/cooling, maintenance equipment, consumer product use, etc.

Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10} and $PM_{2.5}$ associated with land uses anticipated under the R&D Variant would exceed existing BAAQMD thresholds. Under BAAQMD's current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project, no additional feasible mitigation measures are available to reduce the R&D Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact. It should be noted that, as stated above, although the significance under this variant would be similar to the Project, criteria pollutant emissions associated with the operation of uses under the R&D Variant would be greater than the Project, as stated in Table IV-7.

With respect to airborne human health risks, emissions associated with operation activities under the R&D Variant would increase the levels of two potential human health risks: (1) toxic air contaminants (TACs)

and (2) certain vehicle emissions ($PM_{2.5}$). Under the R&D Variant, additional R&D facilities would be constructed and operated within the HPS Phase II area.

The Project would include R&D facilities at HPS Phase II, which are situated on a peninsula extending to the East of the proposed stadium and south of the proposed residential areas. As the predominant winds are out of the west, on-site receptors will generally be upwind from these R&D areas. As such, the Project is designed to minimize potential adverse impacts between TAC sources in R&D areas and both on-site and off-site receptors.

Based on the type of uses permitted under the Project, the potential for TACs to be emitted by the Project and affect nearby receptors would likely only occur within areas designated for R&D uses, which would be restricted to HPS Phase II. Because the Project land use designations provide that a wide range of development can operate in the R&D areas within the HPS Phase II site, the exact type of stationary sources and quantity of the emissions from those sources are not known. As a result, a conservative scenario was established so that the impact of the potential aggregate emissions from all future TAC emission sources in these R&D areas could be evaluated at surrounding receptor locations. However, for the purposes of this analysis, a conservative scenario of potential TAC emissions from each potential future source of TACs was modeled to estimate the potential health impact on nearby receptor locations. It was assumed that each allowable location for TAC emissions would emit chemicals at the maximum allowable rate, when, in fact, the TAC emissions at some of these locations within the R&D area would be below the maximum rate (for example, office building emissions for TAC would be zero or close to zero).Details regarding this assessment can be found in Appendix H1 (Ambient Air Quality Human Health Risk Assessment), Attachment III.[1201]

For this prospective screening-level analysis, a series of conservative assumptions was made:

- A wide range of stationary sources could operate in the R&D area; thus, the identity and amounts of the TACs emitted from these sources cannot be determined at this time.
- In order to approximate the maximum potential number of facilities with TAC emitting sources, the area designated for proposed R&D development would be divided into one-acre plots, which is consistent with the minimum size of a parcel based on the expected land uses within the R&D parcels.
- A single R&D facility (or a stationary source such as a collection of emitting sources like boilers, emergency generators, etc) would be constructed on the one-acre plot.
- The cancer risk at the boundary of each one-acre plot was set not to exceed a designated cancer risk level or chronic noncancer HI threshold (in this case a residential cancer risk of 10 in one million and a chronic noncancer HI of 1.0, in accordance with BAAQMD thresholds of significance).
- It was conservatively assumed that all receptor locations surrounding the R&D area were residential.

Potential health impacts of this scenario were evaluated at receptor locations within approximately 500 meters (about a third of a mile) of the R&D areas. Impacts would be lower beyond this distance. In addition, the TAC analysis conservatively used a total of 5 million square feet of R&D uses, the amount proposed in this Variant. For this screening evaluation, all surrounding receptors were conservatively

[1201] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

evaluated as residential receptors (i.e., potential exposures/risks for other populations would be less, as the exposure frequency and duration would be less than a residential scenario).

Although excess lifetime cancer risk and chronic noncancer HIs were explicitly evaluated, acute risks were not evaluated, as it would be highly unlikely that all emissions sources would be operating at their maximum emission rate at the same time (e.g., for any single hour).

The HRA[1202] estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. All receptors were initially evaluated as residential receptors. The estimated excess lifetime cancer risks and HIs within areas designated for residential use were found not to exceed the BAAQMD's significance thresholds for carcinogenic and noncarcinogenic health risks.

The estimated cancer risks for long-term residential exposure would be above 10 in one million in an area designated as open space or stadium that would extend slightly south beyond the R&D boundary. The maximum estimated cancer risk for a residential receptor in this location would be 26 in one million; the noncarcinogenic health risks would have an HI of 2.6. However, as noted above, this receptor location would be in an area designated as open space or stadium use, and would not be a residential location. If cancer risks were estimated based on exposure assumptions consistent with recreational use of the open space, the risks would be reduced well below the threshold of 10 in one million. Due to the decrease in the frequency and duration of potential exposures, the chronic HI would also be reduced below the HI threshold of 1.0

The estimated health risks would be below BAAQMD thresholds for all residential receptor locations as a result of implementation of the Project. As such, impacts would be less than significant with implementation of mitigation measures MM AQ-6.1 and MM AQ-6.2.

In terms of human health risks associated with vehicle emissions, vehicle trips and thereby vehicle emissions along local roadways would increase with development of the R&D Variant (Variant 1), similar to the Project. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the R&D Variant (Variant 1) were estimated at selected roadways and compared against the 0.2 $\mu g/m^3$ action level to determine the potential health risks on receptors attributed to vehicle emissions from the R&D Variant (Variant 1). Several roadway segments were chosen based on whether Project-related traffic would use these streets to access neighboring freeways and other areas of *San Francisco* and/or currently or would experience significant truck traffic. The roadways chosen include:

- Third Street
- Innes Avenue/Hunters Point Boulevard/Evans Avenue
- Palou Avenue
- Gilman Avenue/Paul Avenue
- Harney Way
- Jamestown Avenue
- Ingerson Avenue

[1202] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

- With the addition of Variant-related traffic, no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of the 0.2 $\mu g/m^3$ action level.[1203] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

Noise and Vibration

As shown in Figure IV-1, the R&D Variant would replace the football stadium proposed under the Project with an additional 2,500,000 square feet of R&D space. Other than the stadium site, land uses provided with a R&D Variant would be the same as the Project. As land uses would remain the same, the potential noise impacts would be the same as the Project with the exception that the noise impact from operation of the stadium would not occur under the R&D Variant.

Construction activities for a R&D Variant would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of mitigation measures MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the R&D Variant, but not to a less-than-significant level as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a R&D Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a R&D Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a R&D Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Noise level increases associated with the R&D Variant are shown in Table IV-8 (R&D Variant Modeled Traffic Noise Levels along Major Project Site Access Roads). Impacts would be significant, similar to the Project. However, in addition to Carroll Avenue, Gilman Avenue, and Jamestown Avenue, which were identified as being significantly impacted by the Project, the R&D Variant would also include

[1203] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Appendix IV, May 4, 2010.

significant noise level increases along 3rd Street and Ingalls Street as shown in the table. Measures available to address significant traffic noise increases in these residential areas are limited. The ultimate feasibility and implementation of the noise insulation measures that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City as the lead agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable.

Table IV-8 R&D Variant Modeled Traffic Noise Levels along Major Project Site Access Roads

Roadway	*Land Use*	*Existing Noise Level*	*2030 Without Project*	*2030 With Project*	*2030 With R&D Variant*	*Variant-Related Increase*	*Allowable Increase*	*Significant Impact?*
Innes north of Carroll Avenue	Residential	53.3	60.9	60.9	60.9	0	2	No
3rd Street south of Carroll Avenue	Residential	**62.8**	**67.3**	**68.3**	**68.5**	**1.2**	**1**	**Yes**
Cesar Chavez Boulevard west of 3rd Street	Residential	59	63.5	63.5	63.6	0.1	2	No
Palou Avenue east of 3rd Street	Residential	56.8	61.6	62.1	62.9	1.3	2	No
Ingalls Street north of Carroll Avenue	Residential	**56.7**	**61.7**	**63.1**	**63.8**	**2.1**	**2**	**Yes**
Carroll Avenue east of 3rd Street	Residential	**52.6**	**53.8**	**58.1**	**58.1**	**4.3**	**3**	**Yes**
Gilman Avenue east of 3rd Street	Residential	**57.7**	**60.6**	**64.6**	**64.6**	**4.0**	**2**	**Yes**
Jamestown Avenue north of Harney Way	Residential	**51.4**	**55.5**	**61.2**	**61.2**	**5.7**	**5**	**Yes**
Harney Way west of Jamestown Avenue	Residential	52.6	59	59.6	59.6	0.6	3	No
Bayshore Boulevard north of Visitacion	Residential	65.1	68.5	68.6	68.7	0.2	1	No

SOURCE: PBS&J 2009
Noise model data sheets are available in Appendix I3 (Traffic Noise Model Output)

Because the R&D Variant would not include a football stadium, noise impacts identified for the Project from football games and concerts would not occur with implementation of the R&D Variant.

The R&D Variant site is not located within an airport land use plan area or near a private airstrip. Furthermore, the R&D Variant does not include an aviation component. Therefore, an R&D Variant will not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources and Paleontological Resources

As shown in Figure IV-1, the R&D Variant would replace the football stadium proposed with the Project with an additional 2,500,000 square feet of R&D space. Both construction and operational impacts would be substantially similar to the Project because construction activities as well as the area and type of land disturbance would be similar. Additionally, the types of land use and associated activities are similar and were all analyzed in the initial land program.

Potential impacts to paleontological resources with the R&D Variant would be substantially similar to the Project and less than significant with mitigation because the amount and type of land disturbance activities (including subterranean development) would be similar. Although no fossils have been reported at the

HPS Phase II site, the presence of Franciscan sedimentary rocks (shanstone, shale, chert, and greenstone) on the flanks of Hunters Point indicates the possibility of fossils being discovered during construction-related excavation. Additionally, the presence of Bay mud under the fill around Hunters Point indicates the possibility of fossils being discovered during construction-related excavation. However, mitigation measure MM CP-3a (paleontological resources) would reduce the effects of construction-related activities to paleontological resources to a less-than-significant level by mitigating for the permanent loss of the adversely affected resources through implementation of a *Paleontological Resources Monitoring and Mitigation Program*. Therefore, the R&D Variant would result in a less-than-significant impact to paleontological resources during construction activities, similar to the Project.

Potential impacts to archaeological resources with the R&D Variant would be substantially similar to the Project and less than significant with mitigation because the amount and type of land disturbance activities (including subterranean development) would be similar. Records indicate that prehistoric archaeological sites are located within the HPS Phase II site, including CA-SFR-9, CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14. Previous archaeological investigations have shown that prehistoric archaeological sites in the HPS Phase II site tend to be located along the original shoreline. Hunters Point had numerous maritime-related industries, including dry docks and boarding houses. In addition, there were several historically documented large offshore "rocks" that presented navigational hazards. Therefore, it is possible that buried shipwrecks may occur within the HPS Phase II site and construction activities may encounter previously unknown archaeological resources. Mitigation measure MM CP-2a (archaeological resources) would reduce the effects of construction-related activities to the archaeological resources in the HPS Phase II site to a less-than-significant level by mitigating for the permanent loss of the adversely affected archaeological resources through implementation of the *Archaeological Research Design and Treatment Plan for the Bayview Waterfront Project, San Francisco, California*. Therefore, the R&D Variant would result in a less-than-significant impact to archaeological resources during construction activities, similar to the Project.

Historical resources at HPS Phase II include the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District, with buildings, structures, and objects associated with the area's "transition from early commercial dry dock operation to high tech naval repair and Radiological research and waste treatment facility."[1204] Contributing resources in the Hunters Point Historic District include Drydock 2, Drydock 3, and Buildings 140, 204, 205, 207, 208, 211, 224, 231, and 253.

- As with the Project, development at HPS Phase II with the R&D Variant (Variant 1) would result in the demolition of Buildings 211, 224, 231, and 253, which have been determined eligible as contributors to the California Register of Historic Resources (CRHR)–eligible Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. While the land use changes with the R&D Variant would not affect the HPS Phase II area within that potential historic district, the implementation of the Variant as a whole would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Implementation of mitigation measure MM CP-1b.1 and MM CP-1b.2 (historical resources) would reduce but not avoid the significant adverse impact. As with the Project, the impact on historical resources with the R&D Variant would remain significant and unavoidable.

[1204] Circa Historic Property Development, *Hunters Point Commercial Dry Dock and Naval Shipyard Historic District DPR form*, October 31, 2008.

Operational activities anticipated with the R&D uses would not differ substantially from the Project because neither would include ground-disturbing activities that would accelerate the potential deterioration of cultural resource. No changes would be made to the land use program within Candlestick Point. These activities would not have the potential to adversely disturb paleontological, archaeological, or historical resources. Therefore, the R&D Variant would result in no impact to these resources, similar to the Project.

Hazards and Hazardous Materials

The building footprint of the R&D Variant would be somewhat greater than the Project, as more structures would be constructed. Construction activities associated with the R&D Variant would: disturb soil and/or groundwater; result in the handling, stockpiling, and transport of soil; involve demolition or renovation of existing structures that could include asbestos-containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury; expose construction workers to hazardous materials; be a source of hazardous air emissions within one-quarter mile of an existing or planned school; and encounter soils or groundwater that contains contaminants from historic uses that could pose a human health or environmental risk if not properly managed. Each of these impacts for the R&D Variant would be slightly greater than for the Project, but, similar to the Project, and would be reduced to a less-than-significant level with implementation of the identified mitigation measures (MM HY-1a.2, MM HZ-1a, MM HZ-1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM HY-1a.1, MM HY-1a.3, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4).

Construction of the R&D Variant would require improvements to existing utility infrastructure and installation of new underground utilities, which could expose construction workers, the public, or the environment to hazardous materials. However, with the implementation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, which require remediation of any contaminated soils, the hazards risk from potential exposure to contaminated soil or groundwater during construction would be reduced to a less-than-significant level, similar to the Project. In addition, mitigation measure MM HZ-2a.2 requires the preparation of a site-specific health and safety plan, which would further ensure that all risks to workers, residents, or the public would be reduced to less than significant, the same as for the Project.

The R&D Variant would require pile supports for the residential towers, the same as the Project. This construction activity could result in groundwater contamination from disturbed soils. Mitigation measure MM HZ-5a would reduce this impact by requiring a foundation support piles installation plan, which would verify that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. With implementation of this mitigation measure, the impact from potential groundwater contamination would be reduced to a less-than-significant level, the same as for the Project.

Shoreline improvements would occur under the R&D Variant the same as for the Project. Shoreline improvements would require concurrence of BCDC, San Francisco RWQCB, and USACE. That permit would contain numerous conditions to ensure that the construction activities are conducted in a manner that is protective of aquatic resources. Mitigation measure MM HZ-10b requires that all shoreline activities that could affect sediment (or in the case of the Navy-installed cover and riprap at Parcel E/E-2) be conducted in accordance with agency-approved remedial design documents, applicable health and safety

plans, DCPs, or any other documents or plans required under applicable law or laws, including but not limited to applicable requirements shown in Table III.K-2 (Remedial Actions, Potential Environmental Effects, and Methods to Reduce Effects). In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts. For Candlestick Point, impacts would be mitigated through mitigation measures MM HY-1a.1 and MM HY-1a.2. With implementation of these mitigation measures, along with applicable regulations and permits, potential impacts related to exposure to hazardous materials releases from contaminated sediments that could be disturbed during proposed shoreline improvements would be reduced to a less-than-significant level for the R&D Variant, the same as for the Project.

Similar to the Project, remediation activities conducted on behalf of the City or developer in conjunction with development activities at HPS Phase II parcels transferred prior to completion of remediation in an "early transfer" would disturb soil and/or groundwater that may contain contaminants from historic uses. The identified mitigation measure (MM HZ-12) would require the SFDPH to ensure that before development occurs, the Agency or the developer and their contractors have incorporated all applicable requirements into remedial design documents, work plans, health and safety plans, DCPs and any other document or plan required under the AOC or other applicable law, as a condition of development. As a result of these controls and mitigation measure, the potential impact of exposure to hazardous materials during remediation activities conducted on behalf of the Agency or the developer in conjunction with development of HPS Phase II under the R&D variant would be reduced to less-than-significant levels.

In addition to uncovering hazardous materials within the existing buildings, construction and grading activities associated with the R&D Variant could disturb soil or rock that is a source of naturally occurring asbestos, which could present a human health hazard. As discussed, above, the R&D Variant includes a greater amount of excavation and construction than that anticipated under the Project. However, with the implementation of mitigation measure MM HZ-15, which requires preparation of an asbestos dust mitigation plan, this impact would be reduced to a less-than-significant level, similar to the Project.

As with the Project, the Bret Harte and Muhammad University of Islam elementary schools are located within one-quarter mile of the development area of the R&D Variant. Consistent with the discussion above, the R&D Variant could uncover asbestos-containing materials (naturally or in existing building materials) or other hazardous materials during construction, consistent with the Project. However, with incorporation of mitigation MM HZ-1a, MM HZ-1b, MM HZ-2a.1, and MM HZ-15, any impacts to these schools would be reduced to a less-than-significant level, similar to the Project.

After development of the R&D Variant, periodic maintenance could require excavation of site soils to maintain or replace utilities, repair foundations, or make other subsurface repairs which could expose hazardous materials. Implementation of mitigation measures MM HZ-1a and MM HZ-1b would require remediation of any contaminated soils pursuant to the appropriate regulations. MM HZ-2a.1 would require the development of an unknown contaminant contingency plan to describe procedures to follow in the event unexpected contamination is encountered during construction activities, including procedures for ensuring compliance with the above laws and regulations. Additionally, mitigation measure MM HZ-2a.2, would require the preparation and implementation of a site-specific HASP in compliance with federal and state OSHA regulations and other applicable laws. The general requirement of mitigation measure MM HZ-9 would require that the Agency or its contractor or Project Applicant shall comply with all

requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent for any properties subject to early transfer (prior to full Navy remediation). To reduce this impact related to exposure to hazardous materials releases that have not been fully remediated at HPS Phase II, mitigation measure MM HZ-9 requires that all work on the Yosemite Slough bridge would comply with Navy work plans for construction and remediation on Navy-owned property. Implementation of these mitigation measures would reduce this impact to a less-than-significant level, same as for the Project.

The R&D Variant would replace the proposed stadium at HPS Phase II with R&D uses. This could result in a greater amount of hazardous materials being used compared to a stadium use, depending on the tenants that would occupy the R&D Variant. After construction, land uses anticipated under the R&D Variant would involve the routine use, storage, transportation, and disposal of hazardous materials to a greater extent than under the Project, depending on the tenants of the R&D area. The R&D Variant would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, the same as for the Project. Products containing hazardous materials used in additional square footage anticipated under the R&D Variant would be incrementally small, and would not substantially increase the risk from handling these materials. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. The Project would comply with all applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials. Impacts would be less than significant, similar to the Project.

Hazardous materials would routinely be transported to, from, and within the Project, and small amounts of hazardous waste would be removed and transported off site to licensed disposal facilities. The precise amount of hazardous materials that would be transported to or from the site under the R&D Variant is difficult to predict accurately at the current time due to the pending selection of tenants for the future retail-commercial stores. However, it is understood that these uses would be consistent with those uses analyzed for the Project and therefore, potential impacts would be similar under this variant to the Project's impacts.

Daily operations under the R&D Variant could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but it would not pose a human health risk and/or result in an adverse effect on the environment. With potentially increased routine use of hazardous materials compared to existing conditions, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of the R&D Variant. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the City. Impacts would be less than significant, similar to the Project.

The R&D Variant site is not located within the San Francisco Airport Land Use Policy Plan Area and the R&D Variant would not result in a safety hazard from airport operations for people residing or working in the area. The site is not located within any other airport land use plan area. The R&D Variant site is also

not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site.

Similar to the Project, operation of the R&D Variant would not expose people or structures to a significant risk of loss, injury, or death involving fires or conflict with emergency response or evacuation plans.

Geology and Soils

As shown in Figure IV-1, the R&D Variant would replace the football stadium proposed with the Project with an additional 2,500,000 square feet of R&D space. Both construction and operational impacts to geology and soils would be substantially similar to the Project, as discussed below, because the type of development and associated construction activities are substantially the same. Additionally, operational activities are the same as those under the Project, with the exception of the football stadium due to its removal.

Construction

As with the Project, construction activities, such as grading and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. The erosion hazard rating for the local soils in the Project site is slight to severe. Requirements to control surface soil erosion during and after construction with the R&D Variant would be implemented through the requirements of mitigation measure MM HY-1a.1 (SWPPP) and adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, would be avoided or reduced to a less-than-significant level, similar to the Project.

In addition to the potential for soil erosion, construction activities would have the potential to affect groundwater levels. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by mitigation measure MM GE-2a (dewatering), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, the R&D Variant would result in a less-than-significant impact, similar to the Project.

At the Alice Griffith Public Housing site and the Jamestown area, the removal of bedrock through heavy equipment methods or controlled rock fragmentation activities would have the potential to fracture rock adjacent to the excavation, thereby destabilizing it and possibly causing settlement of structures above it. With implementation of those techniques, ground surface and building damage monitoring, as specified in the SFBC and required by mitigation measure MM GE-3, vibration from controlled rock fragmentation in the area would not cause unacceptable settlement or damage at adjacent or nearby properties would occur. Consequently, settlement hazards related to controlled rock fragmentation would be less than significant, similar to the Project.

Operation

Impacts with respect to geology and soils conditions with the R&D Variant would be substantially similar to those of the Project.

The potential for exposure to adverse effects caused by seismic groundshaking exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would require design-level geotechnical investigations that would include site-specific seismic analyses to evaluate the peak ground accelerations for design of Variant structures and the Yosemite Slough bridge, as required by the SFBC. Implementation of these mitigation measures would ensure that potential impacts from groundshaking would be less than significant, similar to the Project.

The potential for adverse effects caused by seismically induced ground failure such as liquefaction, lateral spreading, and settlement exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, and MM GE-5a would require design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of Variant structures, as required by the SFBC through review by DBI. It is anticipated that DBI would employ a third-party engineering geologist and/or civil engineer to form a GPRC. The GPRC would complete the technical review of proposed site-specific structural designs prior to building permit approval. The structural design review would ensure that all necessary mitigation methods and techniques were incorporated in the design for Variant foundations and structures to reduce potential impacts from ground failure or liquefaction a less-than-significant level, similar to the Project.

With the R&D Variant, the potential for adverse effects due to seismically induced landslides exists at the Project site. Implementation of mitigation measures MM GE-6a and MM GE-4a.2 would ensure compliance with the SFBC and any special requirements of the HUD for compliance documentation and would reduce potential impacts from landslides a less-than-significant level, similar to the Project.

With the R&D Variant, 2,500,000 square feet of additional R&D space would replace the football stadium that is programmed for development with the Project. This specific area is not located adjacent to the shoreline such that the R&D Variant could result in impacts greater than those discussed with the Project. Therefore, the R&D Variant would result in a less-than-significant impact due to shoreline stability, similar to the Project.

The potential for adverse effects caused by landslides exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual Variant elements, as specified in mitigation measure MM GE-6a. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of this mitigation, the Variant's impact with regard to landslides would be less than significant, similar to the Project.

The potential for adverse effects due to settlement exists at the Project site. However, design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-5a, MM GE-4a.2, and MM GE-4a.3 would ensure compliance with the provisions of the SFBC and would reduce the impact a less-than-significant level, similar to the Project.

The potential for adverse effects caused by expansive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-10a, MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Project structures from expansive soils a less-than-significant level, similar to the Project.

With the R&D Variant, the potential for adverse effects caused by corrosive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-11a, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Project structures from corrosive soils a less-than-significant level, similar to the Project.

Fault rupture hazards are unlikely. Ground rupture occurs most commonly along preexisting faults. No known active faults cross the Hunters Point shear zone, making hazards from fault rupture unlikely with the R&D Variant.[1205] Therefore, there would be no impact caused by surface fault rupture, similar to the Project.

All development with the R&D Variant would be connected to the City's existing wastewater treatment and disposal system and would not involve the use of septic tanks or alternative wastewater disposal systems. No impact would occur, similar to the Project.

The R&D Variant would not substantially change site topography or affect unique geologic features, and would have no impact on such features, similar to the Project.

Hydrology and Water Quality

Construction

The footprint of development for the R&D Variant would be the same as for the Project, although the construction of additional R&D space would slightly increase the extent of excavation for the foundation of buildings. As such, impacts from construction of the R&D Variant would be similar to the Project. With additional R&D buildings replacing the stadium and associated parking lots, the total amount of development would increase, as would the extent of impervious surfaces. Thus, operational impacts to hydrology and water quality would generally be greater than the Project.

With adherence to applicable regulatory requirements, construction activities associated with a R&D Variant would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With additional excavation for building foundations, impacts would be greater than the Project. With implementation of mitigation measures MM HY-1a.1 (preparation of a Storm Water Pollution Prevention Plan—SWPPP—for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

[1205] GTC, 2005.

Construction activities associated with the R&D Variant would include excavation for building foundations and underground utilities which could require short-term and/or long-term dewatering of the affected areas. As no extensive underground space is proposed for the R&D Variant, the installation of underground building elements and utilities would not substantially alter groundwater levels, similar to the Project. As such, the R&D Variant would not substantially deplete groundwater supplies and would result in a less than significant impact, similar to the Project. As the total amount of open space under the R&D Variant would remain the same as under the Project, the amount of permeable surface would also remain the same. Therefore, the R&D Variant would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the R&D Variant site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of the R&D Variant, the existing drainage patterns within the area would generally be preserved. Construction activities associated with the R&D Variant would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on-site or off-site. Impacts would be less than significant, similar to the Project.

Construction activities associated the R&D Variant, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of an SWPPP) impacts would be less than significant, similar to the Project.

Operation

Operation of the R&D Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, the R&D Variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas

California Program would be required by implementation of mitigation measure MM HY-6b.4. As extent of impervious surfaces for the R&D Variant would be greater than the Project, impacts would be greater than the Project.

Development under the R&D Variant would also not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of the R&D Variant could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exist at or near the site currently, or result in substantial erosion, siltation, or flooding on-site or off-site similar to the project. Implementation of the R&D Variant would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a Stormwater Drainage Master Plan (SDMP) and Stormwater Control Plan (SCP) to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of the R&D Variant would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of the R&D Variant would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, the R&D Variant would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

The R&D Variant would replace the football stadium proposed under the Project with an additional 2,500,000 square feet of R&D space. Both construction and operational impacts to biological resources would be similar to the Project, as discussed below, because the type of development and associated construction activities are generally the same.

Construction

Development of the R&D Variant would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, and no impact would occur, similar to the Project.

The R&D Variant would include additional parks and would reconfigure the design and sizes of parks and open space areas at HPS Phase II compared to the Project. The Sports Field Complex proposed with the R&D

Variant would be 40.7 acres, which is 19 acres less than the Sports Field Complex proposed under the Project. Approximately 9.4 acres of new parks and plaza spaces are proposed to be located adjacent to the R&D uses, which would provide additional habitat for common plant and wildlife species. Impacts to common species or habitats would be less than the Project, and remain less than significant, similar to the Project.

Development of the R&D Variant could have a substantial adverse effect, either directly or through habitat modifications, on sensitive natural communities or species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Similar to the Project, the R&D Variant's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b would be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur. Therefore, a net increase in the quality of raptor foraging habitat would result, similar to the Project and, with mitigation, the overall effect on raptors is expected to be beneficial. Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring. Construction activities could impact designated critical habitat for green sturgeon and Central California Coast steelhead; however, compensatory mitigation for lost aquatic habitat as described in mitigation measures MM BI-4a.1 and MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Overall adverse effects would be less than significant, similar to the Project. Mitigation measures MM BI-4a.1, MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would reduce potentially significant impacts to Essential Fish Habitat to less-than-significant levels, similar to the Project. Ecological design features described in the Draft Parks, Open Space, and Habitat Concept Plan would result in increased habitat for western red bats, and impacts to this species would be less than significant.

Development of the R&D Variant could have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project.

Development of the R&D Variant would not conflict with the natural resource protection policies of the General Plan; however, it could result in the disturbance or loss of trees that are protected by the City's Urban Forestry Ordinance and Section 143 of the *Planning Code*. Mitigation measure MM BI-14a would

ensure that development does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. With implementation of mitigation measures MM BI-14a and MM BI-7b, the R&D Variant would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, similar to the Project, and overall impacts would be beneficial.

Operation

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to oysters, and mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to oysters. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Development of the R&D Variant could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site (eelgrass beds). Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce effects on eelgrass by surveying for and avoiding this habitat. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating species to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Implementation of the R&D Variant would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*, and with implementation of mitigation measure MM BI-14a, development would be constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of the R&D Variant would not conflict with any local policies or ordinances protecting biological resources, and there would be no impact.

Public Services

Construction

Police and Fire Services

Similar to the Project, access to the R&D Variant site during construction would be maintained by implementation of a construction management traffic plan (CMTP) MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program

of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the area would be implemented.

Similar to the Project, construction of the R&D Variant would not result in increased demand on police protection services, as demands on the SFPD during construction would be supplemented by private security (as required by mitigation measure MM PS-1 [site security measures during construction]), and construction areas would be secured through the installation of fencing and gates.

Therefore, the R&D Variant would result in a less-than-significant impact to police protection and fire services during construction. As construction of the R&D Variant would not impact SFPD or SFFD response times upon implementation of a CMTP. These impacts would be similar to the Project.

Schools and Library Facilities

Construction of the Project would not result in impacts to the SFUSD or the San Francisco Public Library System. SFUSD or library facilities are not located on the Project site. All area school and library services would be available to the community throughout the duration of Project construction. As such, since construction of the R&D Variant would be similar to construction of the Project, no impact to school or library services during construction of the Variant would occur. These impacts are the same as those identified for the Project.

Operation

Police Protection Services

Operational impacts to police services would be similar to the Project in as much as they would be considered less than significant. However, compared to the Project, the R&D Variant would result in a more substantial long-term daytime only population of employees as a result of the R&D uses. Therefore, impacts to police protection services could be greater than the Project, although still less than significant.

The R&D Variant would replace the football stadium proposed with the Project with an additional 2,500,000 square feet of R&D space. The R&D Variant would not increase the permanent resident population above that anticipated with the Project. However, as shown in Table IV-6, the R&D Variant is anticipated to generate a total of 16,635 jobs, approximately 5,905 more jobs than with the Project. As such, the resident and worker population in the area at full build-out with the R&D Variant would be 41,101.[1206] Patrolling this area and responding to calls would require at least a redeployment of police services within the Bayview District, or within a wider area given the current recommendations for redistricting. Additional police resources that would be required to patrol the football stadium on game days with the Project would not be required with the R&D Variant, thereby reducing that potential impact.

Impacts on police protection services are considered significant if an increase in population or development levels result in inadequate staffing levels (as measured by the ability of the SFPD to respond to call loads) and/or increased demand for services that would require the construction or expansion of new or altered

[1206] Calculated as the combined total of a residential population of 24,465 plus a worker population of 16,635. This is a conservative estimate since it is not likely that the entire resident population and daytime population would be on site at the same time.

facilities that might have an adverse physical effect on the environment. The demand for additional police personnel alone would not be considered a physical environmental impact under the provisions of CEQA.

To estimate personnel requirements for new projects, the SFPD considers the size of the incoming residential population and the expected or actual experience with calls for service from other potential uses of the site. Any potential increase in staffing at the SFPD Bayview Station would be expected to take place throughout the R&D Variant development period with the incremental addition of new housing and new non-residential building space and their occupancy.[1207]

Although the City has no adopted staffing ratio, the existing "level of service" at the SFPD can be determined by comparing citywide police force staffing[1208] to total City population (including both residents and workers). As shown in Table IV-9 (Citywide Number of Police Officers and Estimated R&D Variant [Variant 1] Demand), using a total City population for San Francisco of 1,351,469 and a police department staffing level of 2,033 in 2005, a citywide ratio of 1 officer per 665 people was calculated.[1209] This ratio when applied to the total projected resident and employee population of the R&D Variant at build-out results in the need for an additional 62 police personnel to provide a comparable level of service.

Table IV-9 Citywide Number of Police Officers and Estimated R&D Variant (Variant 1) Demand

		Population	*Police Officers*
Citywide (2005)			
Residents		799,302	
Employees		552,167	
	Total	***1,351,469***	***2,033***
Ratio (officer to population)		1:665	
Project (2032)			
Residents		24,465	
Employees		16,635	
	Total	***41,100***	***62[a]***
Ratio (officer to population)		1:663	
	Project Total		***53***

SOURCES: The population and households data reported for San Francisco is 2005 data provided in a Memorandum from John Rahaim, Director of Planning, San Francisco Planning Department to Michael Carlin, Deputy General Manager, San Francisco Public Utilities Commissions, *Projections of Growth by 2030*, July 9, 2009; SFPD 2005 total staffing: PSSG District Station *Boundaries Analysis*, 2008; Proposed population and employment: Section III.C.

a. The projected number of police officers for the R&D Variant is rounded up, and most closely reflects the 1:665 ratio of the Project.

[1207] PBSJ Meeting with SFPD on April 22, 2008.

[1208] Using a Citywide police force staffing number accounts for the mixed-use nature of the Project, which would include a substantial daytime and resident or nighttime population.

[1209] City population was calculated as a 2005 population of 799,302 plus 2005 employment of 552,167; refer to Table III.C-1 (Existing Population [2005]) and Table III.C-3 (Existing Employment [2005]) of Section III.C (Population, Housing, and Employment).

The SFPD evaluates the need for additional officers by sector, and not station or district needs. The area with the R&D Variant covers two of the five sectors within the Bayview District, both of which have been identified as high demand areas. While it is unlikely that 62 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development with the R&D Variant.

Staffing increases, in and of itself, would not constitute a significant environmental impact; however, the construction of new facilities to serve the additional 62 police officers could create an environmental effect. Additional SFPD personnel needed to serve the R&D Variant would require a station from which to operate. The exact amount of space that would be needed has not yet been determined. However, using an estimate of 110 square feet per person,[1210] the additional 62 police officers would require approximately 6,800 square feet of interior building space. Additional space would be required for staff and visitor parking. According to the SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 62 additional police officers without the reconfiguration and expansion of the existing station or the construction of a new facility.[1211] In addition, the current surface parking lot is not adequate for existing personnel. Structured parking could be provided on the existing parking site.

Currently, the SFPD has no plans for expansion of its Bayview Station. According to the *Boundaries Analysis*, the Bayview Station is not among the priorities for replacement, expansion, improvement, or correction of current deficiencies. However, according to Public Safety Strategies Group (PSSG), there is a considerable amount of wasted or unused space at the Bayview Station that could be reconfigured to accommodate additional officers.[1212] If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,800 square feet (approximately 800 square feet larger than with the Project) could be constructed within the R&D Variant area, on land designated for community serving uses. As part of the R&D Variant, up to 100,000 gross square feet (gsf) of land divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses. With the construction of a new facility or a suitable retrofitting or expansion of the Bayview Station, the SFPD would have ample space to accommodate the additional police officers needed to maintain the SFPD's existing level of service. Therefore, while the development of the Project may require new or physically altered police facilities in order to maintain acceptable police services, the potential impacts associated with the construction of a new facility have been addressed in this EIR and would not require further environmental review. Therefore, the anticipated development would not require new or physically altered police facilities beyond the scope of the R&D Variant in order to maintain acceptable police protection services, and, therefore, operational impacts to police protection services would be less than significant, similar to the Project.

[1210] The Bayview Station is approximately 16,000 gsf, and the capacity is about 140 officers, resulting in about 114 sf per officer.
[1211] Personal communication, John Loftus, Captain, Bayview District Station to Allison Wax, PBS&J, August 31, 2009.
[1212] PBSJ Meeting with SFPD on April 22, 2008.

Fire Protection Services

Operational impacts to fire protection and emergency medical services would be similar to the Project in as much as they would be considered less than significant. However, compared to the Project, the R&D Variant would result in a more substantial long-term daytime only population of employees at the R&D uses. Therefore, impacts on fire protection services and emergency medical could be greater than the Project, although still less than significant.

The R&D Variant would not increase the permanent resident population above that anticipated with the Project. However, as shown in Table IV-6, the R&D Variant is anticipated to generate a total of 16,635 jobs, approximately 5,905 more jobs than the Project. As such, the resident and worker population in the area at full build-out with the R&D Variant would be 41,100.[1213] The increase in the (overall) residential and (R&D Variant-specific) daytime population, combined with an increase in the intensity of physical development in the R&D Variant area, would result in new demand for fire protection and emergency medical services. Additional fire protections resources that would be required to patrol the football stadium on game days with the Project would not be required with the R&D Variant, thereby reducing that potential impact.

Building Safety

Similar to the Project all new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help to minimize the demand for future fire protection services. The R&D Variant would include an additional 2,500,000 square feet of R&D uses. These uses would be provided primarily in buildings that would have a maximum allowable height of 65 feet, although some buildings would be restricted to a maximum of 40 feet as shown on Figure IV-2. Therefore, the R&D Variant would not result in building heights greater than the Project, and impacts would be similar to the Project. Plan review for all structures for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services. In addition, development of the R&D Variant would include expansion of the AWSS to provide water infrastructure for firefighting activities. Therefore, the R&D Variant would result in a less-than-significant operational impact to fire services due to building safety.

Response Time

As discussed with the Project, existing SFFD facilities in the Bayview neighborhood would provide adequate response times to most points within Candlestick Point and no new or physically altered fire or emergency medical facilities would be required in order to maintain an acceptable level of service. However, portions of HPS Phase II would be distant from existing fire stations including those most proximate to the site (Stations 44 and 17), which could result in the SFFD taking anywhere from 8 minutes to 14 minutes to access the HPS Phase II site in the event of an emergency. The SFFD strives to maintain a Code 3 emergency response time of 4.5 minutes, which may not be accommodated due to the distance of the

[1213] Calculated as the combined total of a resident population of 24,465 and a worker population of 16,635. This is a conservative estimate since it is not likely that the entire resident population and daytime population would be on site at the same time.

nearest station from the HPS Phase II site. As such, a new fire station located in closer proximity to the HPS Phase II site would be needed to ensure adequate response times for HPS Phase II. The SFFD does not consider response time to the furthest point of the HPS Phase II site to be acceptable, given the density of proposed development and the distance from the nearest fire station.[1214] Additionally, the R&D Variant would increase the daytime population in this area by approximately 5,905 people, which would further affect the existing SFFD resources. SFFD staff concluded that a fire station would be needed at a site that would offer more rapid response to the HPS Phase II site. Initial SFFD recommendations for such a station included providing one engine (four staff), one truck (five staff), and one ambulance (staff requirements not indicated). Both Station 9 and Station 17 include one engine and one truck, and their approximate building size is 6,100 gsf and 6,000 gsf, respectively. Neither station includes an ambulance. A new approximately 6,000-gsf SFFD station could be accommodated within the R&D Variant site, on land designated for community serving uses. As part of the R&D Variant, up to 100,000 gsf of land divided equally between Candlestick Point and HPS Phase II would be designated for community serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses. The Applicant has designated 5.3 acres of community-serving uses in HPS Phase II, including 0.5 acre of which have been designated for a new SFFD facility.

These uses have been anticipated as part of the R&D Variant and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D (Transportation and Circulation), Section III.H, Section III.I (Noise and Vibration), Section III.J (Cultural Resources and Paleontological Resources), Section III.K (Hazards and Hazardous Materials), and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[1215] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. Therefore, the anticipated development would not require new or physically altered fire facilities. No changes to the land use program at Candlestick Point would occur, beyond the scope of the R&D Variant in order to maintain acceptable fire protection services and operational impacts to fire protection services would be less than significant, similar to the Project.

[1214] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.
[1215] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

Schools

Operational impacts to schools would be similar to the Project. The R&D Variant does not include a residential component in addition to what was considered with the Project. No changes to the land use program at Candlestick Point would occur. The additional R&D uses would not generate school-aged children at the R&D Variant site, and, therefore, impacts would be less than significant, similar to the Project.

Library Facilities

Operational impacts to libraries would be similar to the Project. While the R&D Variant does not include a residential component that would result in the generation of additional permanent residents, the R&D Variant would result in the generation of approximately 5,905 additional employees at the HPS Phase II site. Although the R&D Variant would result in a substantial indirect population increase within the area, library branches that currently serve the area, including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. No changes to the land use program at Candlestick Point would occur. Therefore, the R&D Variant would result in a less-than-significant operational impact to library services, similar to the Project.

Recreation

The R&D Variant would include the construction and improvement of new parks, recreational facilities, and open space. At buildout of this Variant, approximately 327 acres of parks, open space, and recreational uses would be provided, as described in Table IV-3, which is about 9.4 acres less than proposed with the Project. The Sports Field Complex with the R&D Variant would be 69.8 acres, about 21.8 acres less than the Sports Field Complex proposed with the Project, and a total of 160.5 acres of parkland would be provided, about 12.4 acres more than proposed with the Project.

Construction impacts related to recreational facilities would be the substantially the same as those identified with the Project because the construction activities would be substantially similar, with the R&D Variant requiring slightly less construction due to the provision of about 9.4 acres less of parkland.

The R&D Variant would have the same number of housing units as proposed with the Project, thereby resulting in the same residential population of 24,465, although 9.4 acres less of parkland would be provided. Operational impacts are determined based on a ratio of acres of parkland per resident. Currently, the City provides approximately 7.1 acres of parkland per thousand residents, and the standard used in Section III.P (Recreation) assumes a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet the demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. The parkland-to-population ratio associated with the R&D Variant would be 13.4, which is 0.3 less than with the Project. While this ratio is less than proposed with the Project, the R&D Variant ratio would be considerably higher than the ratio of 5.5 acres of parkland per thousand residents, which is considered sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. Impacts would be less than significant.

Park Phasing

The timing of R&D Variant development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities.

The conceptual development plan for this Variant would result in the development of residential units and parks during all of four stages of development. Table IV-10 (R&D Variant [Variant 1] Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the R&D Variant). As this table indicates, the park-to-population ratio would not drop below 8.4 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population. Table IV-10 demonstrates that adequate parkland would be provided during each stage of development. However, during a given phase, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed, and a less-than-significant impact would result.

Table IV-10 R&D Variant (Variant 1) Residential Units and Park Acreage Provided during Each Stage of Development

Stage of Development	*Residential Units*	*Population*	*Total Parkland (ac)*	*Park-to-Population Ratio (acres per 1,000 Residents)*
Existing	256	1,113[a]	120.2	108
Phase 1	3,160	7,363[b]	135.8	18.4
Phase 2	5,165	12,034[b]	147.1	12.2
Phase 3	7,670	17,871[b]	150.6	8.4
Phase 4	10,500	24,465[b]	327.0	13.4

a. Refer to Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Employment, and Housing). This population correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.
b. Calculated as 2.33 people per residential unit.

Senate Bill 792 (SB 792) (refer to Appendix P2 [SB 792]) was signed by the Governor on October 11, 2009, and is codified as Chapter 203 of the Statutes of 2009. SB 792 repeals the *Hunters Point Shipyard Conversion Act of 2002,* the *Hunters Point Shipyard Public Trust Exchange Act,* and *Public Resources Code* Section 5006.8, and consolidates the key provisions of those statutes into a statute covering both the Candlestick Point area and HPS. The statute authorizes a reconfiguration of CPSRA coupled with improvements within the park and the provision of an ongoing source of park operation and maintenance funding. The proposed reconfiguration would remove about 29.2 acres from the current boundaries of CPSRA to be used for urban development, but would add about 5.7 acres not currently included in the CPSRA to The Neck, The Heart of the Park, and The Last Port areas of the CPSRA. These additional acres would widen the park at

in an area where the CPSRA boundary currently runs very close to the shoreline, creating a very narrow "pinch point" in the park. The additional acreage would thus create a buffer between development and the shoreline and improve the recreational value of this section of the park. In total, the area of the CPSRA (excluding the Yosemite Slough) would decrease by about 23.5 acres at the Candlestick Point site, from 120.2 acres to 96.7 acres, which is the same as the Project.

While the reconfiguration of CPSRA would remove a net of 29.2 acres from the park, all of that acreage is degraded or unimproved (and not maintained) and does not provide substantial recreation opportunities to the community. Most of the land that would be removed from CPSRA is either currently used for stadium parking or is directly adjacent to Harney Way. The reconfiguration would add 5.7 acres of new parkland in The Last Port, The Neck, and The Heart of the Park, all areas that are currently developed and actively used that have high value as recreational resources. This additional acreage would widen the park at this important point, increasing its capacity for new users. Although there would be a net decrease in the total area of the CPSRA, that portion of the CPSRA that is currently developed and used for recreational purposes would be further expanded (by 5.7 acres) and improved.

Moreover, the R&D Variant would provide substantial improvements throughout the CPSRA. These improvements, which are described at length in the discussion of Impact RE-2, include revegetation and landscaping, shoreline restoration and stabilization, infrastructure improvements (such as trails, pathways, and visitor facilities), the provision of habitat and opportunities for environmental education, "Eco-Gardens," and salt-marsh restoration. Figure III.P-8 shows the existing unimproved and improved areas of the CPSRA and indicates where land would be removed or added relative to the existing CPSRA uses. These improvements would turn portions of the Park that are used for Candlestick Park stadium parking or are undeveloped and underutilized into vibrant parts of the CPSRA and of the overall network of parks. Currently improved parts of the CPSRA, such as The Heart of the Park, The Point, The Neck, and The Last Port, would also be improved. Overall, the reconfiguration and improvements would enhance park aesthetics and landscape ecology; provide connections throughout the CPSRA and the other parks; and provide direct access to the Bay and the Bay shoreline for walking, swimming, fishing, kayaking, and windsurfing. The Variant's proposed reconfiguration of the CPSRA, therefore, would not adversely affect the park's existing recreational facilities and opportunities.

The improvement and development of the CPSRA is expected to increase usage of CPSRA by visitors. While the number of additional visitors cannot be accurately predicted at this time, the Project's improvement will increase the amount of land at CPSRA that provides recreational opportunities (as discussed above), and will thus enable the park to accommodate the new demand. Moreover, the agreement between CDPR and the City or the Agency, providing for the reconfiguration of CPSRA, would also provide at least $10 million in funding for operation and maintenance of the park, further enabling the park to accommodate increased demand.

A Technical Memorandum was prepared to study wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes development at the Project site (even if under the R&D Variant), generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would

experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). The Variant would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

In summary, impacts resulting from the R&D Variant would be substantially similar to the Project.

Utilities

Water

The operational activities of the R&D Variant would be similar to those of the Project in as much as there would be temporary, daytime populations at the R&D Variant site and full-time residential populations that generate retail water demand from San Francisco Public Utilities Commission (SFPUC).

With the R&D Variant, the football stadium proposed with the Project for the HPS Phase II site would be replaced by 2,500,000 square feet of additional R&D space. The R&D Variant would have the same number of residential units as the Project, but would increase the temporary, daytime population of employees. As shown in Table IV-11 (R&D Variant Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance [mgd]), the R&D Variant would consume approximately 1.99 million gallons per day (mgd) of water. With existing water use at the CP-HPS Phase II site of 0.3 mgd, the net change in water demand with the R&D Variant would be an increase of 1.69 mgd, an increase of 0.32 mgd over the Project.

Table IV-11 R&D Variant Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance (mgd)

Land Use	*Candlestick Point*	*Hunters Bay Shipyard*	*Total*
Residential	0.61	0.22	0.83
Hotel	0.05	0.00	0.05
Office	0.04	0.02	0.06
R&D	0.00	0.71	0.71
Neighborhood Retail	0.02	0.02	0.03[a]
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.00	0.00
Performance Venue	0.01	0.00	0.01
Subtotal	*0.82*	*0.98*	*1.80*[a]
Parks and Open Space	0.05	0.14	0.19
Total Demand	***0.88***[a]	***1.13***[a]	***1.99***[a]
Existing Demand			0.30
Net Change in Demand			***1.69***

SOURCE: PBS&J, Candlestick Point–Hunters Point Shipyard Phase II Water Supply Assessment, October 2009.

a. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals used in this table. These entries are correct and consistent with Table 4-2 of the Water Supply Assessment.

As with the Project, sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System, and thereby meet retail demand for water treatment, including the net increase of 1.69 mgd for the R&D Variant. As the current and planned treatment capacity of existing RWS water treatment facilities is sufficient to serve the R&D Variant, implementation of this variant would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant, similar to the Project.

As with the Project, beginning in 2025, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with the R&D Variant. With the implementation of the WSAP and RWSAP during multiple dry-year periods, which could include voluntary rationing or other water conservation strategies, existing and projected future water supplies could accommodate estimated future water demand, including the Project-related demand. As discussed in the WSA, the SFPUC has approved and has made substantial progress towards the implementation of the water facility improvement projects identified in the WSIP. The SFPUC has received voter approval to fund the Phased WSIP program and has initiated bond sales to fund implementation of individual projects, which are in various stages of implementation, including subsequent environmental review, design, or construction.[1216] Thus, there is substantial evidence that the SFPUC would implement the Phased WSIP facility projects described above, including the local water supply projects.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects, and various conservation efforts. The proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco.[1217,1218] Recycled water will primarily be used for landscape irrigation, toilet flushing, and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project is expected to begin environmental review in late 2009 or early 2010. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project. The local water supply improvement projects were approved as part of the Phased WSIP and are included in the WSIP funding program. The SFPUC has initiated planning, environmental review, and design of several recycled water and groundwater projects and conservation programs are in place. Thus, there is substantial evidence that the additional water provided by those projects would be available to supplement retail water supplies.

As noted above, the SFPUC adopted the Phased WSIP, which phased implementation of the water supply program to provide an additional 20 mgd of supply to meet projected demand through 2018 and requires the SFPUC to re-evaluate water demands and water supply options by December 31, 2018, through 2030 to meet projected demand. The R&D Variant would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, and this impact is less than significant, similar to the Project.

[1216] Per the *Water System Improvement Program Quarterly Report, Q4, FY 2008/2009* (dated August 20, 2009), (prepared by the SFPUC), as of July 1, 2009, two (2) projects are in the Planning Phase, eleven (11) projects are in the Design Phase, six (6) projects are in the Bid and Award Phase, five (5) projects are in the Construction Phase, two (2) projects in the Close-Out Phase, eight (8) projects are completed, one (1) project has not been initiated, and eleven (11) projects have multiple active phases. Available at: http://sfwater.org/Files/Reports/01_RW_Program_Summary.pdf Accessed September 28, 2009.
[1217] San Francisco Planning Department, Final Program Environmental Impact Report, Water Supply Improvement Program, October, 2008.
[1218] SFPUC, Urban Water Management Plan, 2005.

Wastewater

The construction impacts of the R&D Variant would be substantially similar to the Project because the construction activities required with both would be similar.

The operational activities of the R&D Variant would be similar to those of the Project in as much as there would be temporary, daytime populations at the R&D Variant site that require wastewater utilities that are connected to the City's systems. The R&D Variant would replace or upgrade existing wastewater infrastructure within the R&D Variant site.

With the R&D Variant, the football stadium proposed with the Project for the HPS Phase II site would be replaced by 2,500,000 square feet of additional R&D space. The R&D Variant would have the same number of residential units as the Project, but would increase the temporary, daytime population of employees. As shown in Table IV-12 (R&D Variant Wastewater Generation), the R&D Variant would result in the generation of approximately 1.35 mgd of wastewater, an increase of 0.17 mgd of wastewater over the Project.

Table IV-12 R&D Variant Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as % of Water Demand (or as otherwise specified)*	*Candlestick Point (mgd)*	*Hunters Point (mgd)*	*Total R&D Variant (mgd)*
Residential	95%	0.58	0.21	0.79
Regional Retail	57%	0.05	0	0.05
Neighborhood Retail	57%	0.01	0.01	0.02
Office	57%	0.02	0.01	0.03
Community Uses	57%	0.01	0.01	0.02
Research and Development	57%	0	0.40	0.40
Hotel	57%	0.03	0	0.03
Football Stadium	95%	0	0	0
Performance Venue	95%	0.01	0	0.01
Total		***0.71***	***0.64***	***1.35***

SOURCE: Arup, October 15, 2009.

The 1.35 mgd of wastewater projected for operation of the R&D Variant would be transported via new or expanded conveyance systems within the R&D Variant site and existing mains to the Southeast Water Pollution Control Plant (SWPCP).[1219] The existing wastewater/stormwater conveyance lines between the HPS Phase II site and the SWPCP are sized to accommodate both dry- and wet-weather flows. Wastewater from the R&D Variant site would flow into the Hunters Point tunnel sewer (from the HPS Phase II site) and the Candlestick and Hunters Point tunnel sewers (from the Candlestick Point site). The] Hunters Point tunnel sewer has an average dry-weather flow of 6 mgd (4,167 gallons per minute [gpm]) and a design capacity of 120 mgd (83,333 gpm) (refer to Table IV-13 [Sewer Trunk Capacity and R&D Variant Maximum Peak

[1219] *Candlestick Point/ Hunters Point Shipyard Infrastructure Concept Report* (October 26, 2009) prepared by Winzler & Kelly Consulting Engineers.

Flows]).[1220] Peak dry-weather flow capacities can be calculated by multiplying the average gallons-per-minute flow by a peaking factor. For purposes of this analysis, a conservative peak factor of 3.0 was used, which yields a maximum flow capacity of 12,501 gpm for the Hunters Point tunnel sewer. Projected maximum peak flows from the HPS Phase II development with the R&D Variant, based on a peaking factor of 3.0, would be approximately 1,333 gpm.[1221] The remaining capacity of the Hunters Point tunnel sewer is 69,499 gpm. Therefore, the addition of approximately 1,333 gpm of peak flow from HPS Phase II with the R&D Variant would be accommodated within the remaining capacity (69,499 gpm) of the Hunters Point tunnel sewer. Stormwater flowing from the Candlestick Point Development (2,500 gpm maximum) would be the same with the R&D Variant as the Project as the land use program would not change. Therefore, the R&D Variant would result in a less-than-significant impact to wastewater conveyance, similar to the Project.

Table IV-13 Sewer Trunk Capacity and R&D Variant Maximum Peak Flows

Sewer Trunk	*Design Capacity (gpm)*	*Existing Average Dry-Weather Flow[a] (gpm)*	*Existing Maximum Peak Dry-Weather Flow[b] (gpm)*	*Variant Contribution—Maximum Peak Dry-Weather Flow[c] (gpm)*	*Remaining Peak Flow Capacity (gpm) With R&D Variant*
Candlestick tunnel sewer	34,722	1,736	5,208	1,479	28,035[e]
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	1,333	69,499[f]

SOURCE: Bayside Operations Plan, 2002.

a. Calculated as existing average dry-weather flow in mgd/24 hours/60 minutes 1,000,000.
b. Calculated as existing average flow in gpm x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in mgd/24 hours/60 minutes X 1,000,000 X peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses at Candlestick Point (including Alice Griffith Public Housing, the RV park, and the stadium) that will be demolished on site and that currently contribute to the Candlestick tunnel sewer. Therefore, the actual remaining peak flow capacity of the Candlestick tunnel sewer with the Project will be somewhat greater than 28,035 gpm.
f. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses on the HPS Phase II site that will be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with the Project will be somewhat greater than 69,853 gpm.

Because the existing conveyance infrastructure could accommodate the additional flows from the HPS Phase II development in addition to existing flows even during periods of peak flows, no expansion of the off-site wastewater conveyance lines would be required as a result of the R&D Variant development.

The contribution of the R&D Variant to the Bayside system represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development of the R&D Variant would increase wastewater flows (as intermittent flows from Candlestick Park stadium would be replaced by year-round flows from mixed-use development), the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System.

The land use program and associated stormwater flows from the Candlestick Point site would be the same with the R&D Variant as with the Project. Therefore, treatment of stormwater would also be the same as with the Project. Stormwater from the HPS Phase II site is collected and discharged to the Bay via a

[1220] San Francisco Public Utilities Commission, Bayside Operations Plan, 2002.
[1221] Calculated as 0.64 MGD/24 hours/60 minutes * 3.0*1,000,000.

separate stormwater system, which does not contribute any flows to the Combined Sewer System during wet weather. With the R&D Variant, stormwater would continue to be collected and treated in a separate stormwater system, and no stormwater runoff would be contributed to the Combined Sewer System during wet weather. Although development with the R&D Variant at the HPS Phase II site would result in a net increase in wastewater flows of 1.35 mgd, the additional flows would represent less than 0.1 percent of the remaining treatment capacity of the SWPCP. The increase in wastewater generation with the R&D Variant would incrementally contribute to the total amount of wet-weather flows that are collected and treated at the SWPCP, the North Point Wet Weather Facilities (NPWWF), and the Bayside Wet Weather Facilities. When the combined storage and treatment capacity of those facilities are exceeded, wastewater from the R&D Variant development could be discharged, along with other wet-weather flows from the combined system, via the CSOs located around the perimeter of San Francisco. Mitigation measure MM UT-3a would ensure that there would be no net increase in wet-weather flows in the Combined Sewer System as a result of the Project that could result in a temporary increase in CSO volume. During wet weather, the temporary retention or detention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project would ensure that there would be no increase in the likelihood of a CSO event as a result of the Project. The impact would be less than significant, similar to the Project.

The NPDES permit system requires that all existing and future municipal and industrial discharges to surface waters within the City be subject to specific discharge requirements. Wastewater from the R&D Variant would be treated at the SWPCP wastewater treatment plant and the SFPUC, who operates the SWPCP wastewater treatment plant, is required to comply with waste discharge requirements (WDRs) set by the RWQCB, which specify the allowable levels of pollutants in discharges from the facility. Compliance with any applicable WDRs, as monitored and enforced by the SFPUC, would ensure that the R&D Variant does not exceed the applicable wastewater treatment requirements of the RWQCB, and this impact would be less than significant, similar to the Project.

Solid Waste

Construction wastes with the R&D Variant, including demolition and hazardous wastes, would be similar to that generated with the Project because the materials used for construction would be substantially similar for both. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste that is ultimately taken to a landfill. Incorporation of mitigation measure MM UT-5a (Construction Waste Diversion Plan) would ensure that impacts to solid waste during construction are reduced to a less-than-significant level.

Operational

Operational impacts of the R&D Variant would be substantially similar to the Project because the amount and type of solid waste generated would be similar, recycling activities would be implemented with both projects, and neither project would result in the exceedance of current landfill capacities. As shown in Table IV-14 (R&D Variant Solid Waste Generation), the R&D Variant would result in approximately 9,143.3 tons of waste at full build-out of the HPS Phase II site, an increase of approximately 1,723 tons over the Project, for a total R&D Variant annual waste generation of 22,225 tons. This total waste stream would constitute approximately

Table IV-14 R&D Variant Solid Waste Generation

Use	Generation Factor (per day)	Candlestick Point			HPS Phase II			Total		
		Area or Units	Tons per Day or Event	Tons per Year	Area or Units	Tons per Day or Event	Tons per Year	Area or Units	Tons per Day or Event	Tons per Year or per Total Number of Events[a]
Residential	5.653 lbs/unit	7,850 units	22.2	8,103	2,650 units	7.5	2,737.5	10,500 sf	29.7	10,840.5
Retail	0.02600411 lbs/sf	760,000 sf	9.9	3,613.5	125,000 sf	1.6	584.0	885,000 sf	11.5	4,197.5
Office	0.006 lbs/sf	150,000 sf	0.5	182.5	0	0	0	150,000 sf	0.5	182.5
Hotel	0.0108 lbs/sf	150,000 sf	0.8	292.0	0	0	0	150,000 sf	0.8	292.0
R&D	0.006 lbs/sf	0	0	0	5,000,000 sf	15	5,475	5,000,000 sf	15	5,475
Performance Venue	2.23 lbs/seat	10,000 seats	5.6[b]	836.3[c]	0	0	0	10,000 seats	5.6	836.3[c]
Stadium	2.23 lbs/seat	0	0	0	0	0	0	0	0	0
Art Center	0.006 lbs/sf	0	0	0	255,000 sf	0.8	292	255,000 sf	0.8	292.0
Community Facilities	0.006 lbs/sf	50,000 sf	0.15	54.8	50,000 sf	0.15	54.8	100,000 sf	0.3	109.6
Total				***13,082***			***9143***			***22,225***

SOURCE: PBS&J 2009; Generation Factors from Arup, *Carbon Footprint Report*, March 24, 2009.

a. Calculated by adding the horizontal columns, rather than calculating total number of units by the generation rate.
b. The Performance venue is projected to be 50 percent attendance.
c. Assumes 150 events per year at 50 percent attendance. Attendance estimate is based on CABER, Towson University & Sage Policy Group, Inc., *The Economic Feasibility of a Montgomery County, MD Arena*, June 2007.
d. Assumes a sold-out event with a 5 percent "no-show" rate.
e. Assumes 12 sold-out games and 20 other sold-out stadium events per year.

3.6 percent of the City's total waste stream.[1222] The increase in solid waste generation associated with the R&D Variant development would not be substantial in the context of citywide solid waste infrastructure demand.

Landfill capacity is a dynamic metric dependent on the amount of solid waste that requires disposal (and the effectiveness of source reduction and recycling methods), the permitted capacity of the landfills, and the number of landfills that can accommodate solid waste. The City has a contract with Altamont Landfill to accept the City's waste through 2014. In 1988, the City of San Francisco entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste. Through August 1, 2009, the City has used 12,579,318 tons of this capacity. The City projects that the remaining capacity would be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[1223]

The City has issued a Request for Qualifications to solicit bids for a new contract to accommodate the City's disposal capacity beyond the expiry of the current agreement. The City has selected three landfills that have the capacity to meet the City's future needs and is in the final stages of the selection process that will result in an agreement for ratification by the Board of Supervisors no later than early 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs As noted, at current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, its permit expires three years earlier, in January 2029.[1224] Demolition activities, which generate construction debris, are expected to conclude in 2028 at Candlestick Point and in 2023 at HPS Phase II, one year before the landfill is expected to close. Further, the City requires the diversion of at least 75 percent of construction waste for new construction, as also required by MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the R&D Variant on solid waste would be further reduced. The impact of the construction waste generated by the R&D Variant on the capacity of the Altamont Landfill would be less than significant.

Typical municipal solid waste has a landfill density of 739 pounds per cubic yard.[1225] Using this density factor, 45.7 million cubic yards of remaining capacity at the Altamont Landfill would be equivalent to 33.7 million tons of remaining capacity. The contribution of 22,472 tons annually with the R&D Variant would represent 0.06 percent of the remaining capacity of the Altamont Landfill. Additionally, approximately 72 percent of the City's total waste stream, by volume, was diverted in 2008.[1226] Of the wastes that were not diverted, the City estimates that up to 65 percent of the total volume consists of readily recyclable or compostable materials, such as paper and food scraps.[1227] The remainder of the wastes consists of materials such as disposed household items and furniture, hazardous wastes, and construction wastes. The City has

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[1222] California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Accessed online at: <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco>, Accessed: November 5, 2008. 627,157 total tons of solid waste in 2007.
[1223] E-mail communication with David Assman, City of San Francisco, Department of the Environment, October 19, 2009.
[1224] CIWMB, 2009.
[1225] http://wasteage.com/mag/waste_municipal_solid_waste/. Accessed September 29, 2009.
[1226] This figure is a preliminary estimate and represents the most recent data available. California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Available at <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco>, Accessed: November 5, 2008.
[1227] San Francisco, *Waste Characterization Study: Final Report.* 2008.

prepared a number of strategies to divert additional solid waste and achieve citywide diversion goals. These strategies would be utilized to achieve the City's overall waste reductions goals. The City's contribution to landfills is anticipated to diminish over time as the City implements more aggressive waste diversion strategies. Increasing solid waste diversions would extend the life of the landfills utilized by the City, lengthening the time horizon before the remaining disposal capacity is filled.

All residents and businesses with the R&D Variant would be expected to comply with the City's waste and recycling ordinances. On the basis of the landfill capacity and diversion strategies noted above, and with implementation of mitigation measure MM UT-7a (Site Waste Management Plan), the R&D Variant would result in a less-than-significant impact to solid waste, similar to the Project.

Electricity, Natural Gas, and Telecommunications

The proposed improvements within the Project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. The power supplier may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into the Project site. This could include a new substation within the project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the R&D Variant, similar to the Project. Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR. The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for the R&D Variant, similar to the Project.

Energy

Construction

Construction activities of the R&D Variant would be similar to the Project as the construction equipment usage, types of energy resources needed, type of construction activities, and construction timeline would be similar.

The construction activities proposed with the R&D Variant do not include unusual or atypical activities that would result in a higher than average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy. Thus, construction activities would not be large in comparison to a project of a similar size and with similar land uses, and the R&D Variant would result in a less-than-significant impact, similar to the Project.

Operation

Electricity

The operational impacts of the R&D Variant would be similar to the Project because the types of energy required and the proposed uses would be similar to that considered with the program for the Project. However, the R&D Variant would result in the demand for more electricity than the Project; therefore, impacts would be greater (about 25 percent greater). As discussed in Section III.R (Energy), the operational impacts of a project are considered significant if it encourages activities that result in the use of large amounts of energy or uses such resources in a wasteful manner. The criterion for this impact considers whether the R&D Variant would result in a large increase in electricity consumption. As shown below in Table IV-15 (R&D Variant Electricity Demand from Building Envelopes [MWh]), the R&D Variant would be expected to result in an electricity demand of approximately 41,945 Megawatt hours (MWh). While about 4 percent more than the Project, this would not be a large overall increase in consumption over the existing conditions of 9,990 MWh; however, two uses (residential and R&D) would account for 90 percent of the increase in demand for electricity at the site. R&D uses would be the largest source of electricity consumption at HPS Phase II, while residential units would be the largest source of electricity consumption at Candlestick Point. Because R&D uses result in heavy electricity consumption during peak daytime hours (largely due to HVAC, lighting, and the operation of office equipment), the R&D Variant could generate high levels of peak demand, similar to the Project.[1228]

Taking the R&D Variant's compliance with the Green Building Ordinance and its voluntary implementation of energy-saving design features into consideration, as well as the level of development proposed, the electricity increase associated with the R&D Variant would not be considered large.

The City's threshold also considers whether the R&D Variant's energy consumption would be wasteful. The efficiency measures proposed under the R&D Variant would result in building envelope consumption of at least 15 percent less electricity than a project that would not implement such measures. Further electricity savings would be anticipated as a result of the R&D Variant's compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and the R&D Variant's voluntary implementation of LEED® ND standards. However, because the R&D Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the R&D Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts to less

[1228] Although the R&D Variant would include on-site electricity infrastructure, local delivery infrastructure is supplied by larger transmission lines, substations, and generation facilities owned by PG&E and other entities. Adding new connections to the overall power grid, thereby increasing demand on the grid, contributes to the need for periodic infrastructure upgrades. More importantly, because electricity cannot be stored once generated, the need for development of additional electricity generation sources is largely dependent on the peak level of conveyance. Designing electricity infrastructure is similar to designing highways, which are sized to convey rush-hour demand.

Table IV-15 R&D Variant Electricity Demand from Building Envelopes (MWh)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Electricity Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)[a]*	*Development Program[b]*	*MWh Consumed Annually, 2008 Title 24 Standards[c]*	*MWh Consumed Annually, with 15% Reduction*	*Development Program[b]*	*MWh Consumed Annually, Title 24 Standards[c]*	*MWh Consumed Annually, with 15% Reduction*	*Development Program*	*MWh Consumed Annually, Title 24 Standards*	*MWh Consumed Annually, with 15% Reduction*	*Percent of Total Electricity by Land Use*
Residential Units	1.7350[d]	7,850	13,620	11,577	2,650	4,598	3,908	10,500	18,218	15,485	37%
Retail	0.0027	635,000	1,715	1,457	—	0	0	635,000	1,715	1,457	3%
Neighborhood Retail	0.0027	125,000	338	287	125,000	338	287	250,000	675	574	1%
Office	0.0052	150,000	780	663	—	0	0	150,000	780	663	2%
R&D	0.0052	—	0	0	5,000,000	26,000	22,100	5,000,000	26,000	22,100	53%
Hotel	0.0027	220	1	1	—	0	0	220	1	1	0%
Artist Studios/ Center	0.0052	—	0	0	255,000	1,326	1,127	255,000	1,326	1,127	3%
Community Space	0.0052	50,000	260	221	50,000	260	221	100,000	520	442	1%
Arena	0.0015	75,000	113	96	—	0	0	75,000	113	96	0%
Total			***16,825***	***14,301***		***32,522***	***27,643***		***49,348***	***41,945***	***100%***

SOURCES:

R&D Variant electricity demand was estimated based on the Applicant's commitment to achieve 15 percent energy reductions below Title 24 standards and use ENERGY STAR appliances in all residential units.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15 percent Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. Based on buildout floor areas provided in Table IV-3 of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The electricity factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

e. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

than significant. The City's significance criterion also considers whether a project's energy consumption would be wasteful. The efficiency measures proposed with the R&D Variant would result in less electricity consumption than a project that would not implement such measures. These measures include installation of ENERGY STAR appliances, a measure aimed at reducing residential electricity consumption, which as discussed in the preceding paragraph, is a land use with correspondingly high energy consumption. Therefore, the R&D Variant has demonstrated a good faith effort to avoid wasteful consumption of energy for residential uses. In addition, as discussed in the preceding paragraph, the R&D Variant Applicant would be required to comply with the City's Green Building Ordinance and has committed to pursuing LEED® credits.[1229] Thus, electricity consumption with the R&D Variant development would be considered efficient and not wasteful. Operational electricity impacts would be less than significant, similar to the Project.

Natural Gas

The operational impacts of the R&D Variant would be similar to the Project as the types of energy required and the proposed uses would be similar to that considered with the program for the Project. However, the R&D Variant would result in the demand for almost twice the natural gas demand of the Project.

Table IV-16 (R&D Variant Natural Gas Demand, Baseline [MBtu]) presents the annual natural gas use for the R&D Variant, estimate based on land use and minimal compliance with Title 24 standards as well as the R&D Variant Applicant's preliminary commitment to reduce energy use to 15 percent below Title 24 standards. The natural gas demand associated with the R&D Variant would be approximately 98,563 MBtu, in comparison to a similarly sized project that would not include the 15 percent reduction below 2008 Title 24 standards and which would result in consumption of approximately 116,670 MBtu of natural gas use annually.

However, this is approximately 35,300 MBtu more than the Project.

The natural gas use at the Project site would represent less than 1 percent of the City's overall natural gas consumption of 28,918,000 million Btus, and overall natural gas demand would be over four times higher than under existing conditions, largely attributable to R&D uses at HPS Phase II. Natural gas use would be roughly five times higher at HPS Phase II than at Candlestick Point due to peak daytime demand from R&D uses. However, on a per-square-foot basis, the R&D Variant would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

However, because the R&D Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the R&D Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts to less than significant.

All natural gas impacts would be less than significant, similar to the Project.

[1229] Savings associated with these features cannot be calculated until the designs of individual buildings have been completed.

Table IV-16 R&D Variant Natural Gas Demand, Baseline (MBtu)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)*[a]	*Development Program*[b]	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Development Program*[b]	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Development Program*	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Percent of Total by Land Use*
Residential Units	0.0360[d]	7,850	283	240	2,650	95	81	10,500	378	321	0%
Retail	0.0048	635,000	3,048	2,591	—	—	—	635,000	3,048	2,591	3%
Neighborhood Retail	0.0048	125,000	600	510	125,000	600	510	250,000	1,200	1,020	1%
Office	0.0200	150,000	3,000	2,550	—	—	—	150,000	3,000	2,550	3%
R&D	0.0200	—	—	—	5,000,000	100,000	85,000	—	100,000	85,000	86%
Hotel	0.0345	220	8	6	—	—	—	220	8	6	0%
Artist Studios/ Center	0.0200	—	—	—	225,000	4,500	3,825	225,000	4,500	3,825	4%
Community Space	0.0200	50,000	1,000	850	50,000	1,000	850	100,000	2,000	1,700	2%
Arena	0.0243	75,000	1,823	1,549	—	—	—	75,000	1,823	1,549	2%
Total			***9,761***	***8,297***		***106,909***	***90,266***		***116,670***	***98,563***	***100%***
Percent of Total			***8%***			***92%***			***100%***		

SOURCES:

Baseline R&D Variant natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The natural gas factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

b. Based on buildout floor areas provided in Table IV-3 of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The natural gas factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor is in the "Natural Gas Delivered, Total" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

e. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

Similar to the Project, the R&D Variant would increase trips to and from the site, increasing the use of petroleum fuels. However, this consumption would not be wasteful because (1) the R&D Variant proposes to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements, (2) the R&D Variant would include a transportation demand management (TDM) program designed to reduce the remaining vehicle trips, and (3) the R&D Variant would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. Therefore, the R&D Variant would result in a less-than-significant impact due to the wasteful use of transportation-related fuels, similar to the Project.

Greenhouse Gas Emissions

As shown in Table IV-3, the R&D Variant would replace the 49ers stadium proposed with the Project with an additional 2,500,000 gsf of R&D space (total R&D uses would equal 5,000,000 gsf). Construction impacts would be substantially similar to the Project. Operational impacts would be similar but greater than those identified under the Project as the proposed additional R&D development would result in greater annual GHG emissions than the stadium. The methodologies used to estimate GHG emission for the R&D Variant are the same as described in Section III.S (Greenhouse Gas Emissions) for Project GHG emissions.

Construction

- As stated above, overall construction impacts of the R&D Variant (Variant 1) with respect to climate change and GHG emissions would be similar to the Project. Construction activities would occur from the use of construction equipment, workers commuting, and soil hauling activities. The GHG emissions associated with the construction activities are short-term in duration and would be a total of 129,274 tonnes CO_2e. When this is distributed over an anticipated time schedule of 20 years, approximately 6,464 tonnes per year would be emitted. Since these emissions are short in duration and small in comparison to the overall construction and mining emissions for the San Francisco Bay Area Air Basin GHG emission inventory, the R&D Variant GHG emissions for construction would be less than significant similar to the Project.

Operation

Operational impacts to climate change and GHG emissions would be substantially similar to the Project. Under the R&D Variant, the football stadium proposed under the Project would be replaced with 2,500,000 square feet of additional R&D space at the HPS Phase II site. Development of Candlestick Point would be similar to the Project except for a slight increase in emissions associated with mobile sources. Table IV-17 (R&D Variant Annual GHG Emissions) shows the emissions for Candlestick Point under the R&D Variant. Due to the additional building space and additional traffic associated with the R&D space added, the GHG emissions at HPS Phase II site would be slightly higher. The breakdown in operational GHG emissions for HPS Phase II is shown in Table IV-17.

The operational emissions were compared to ARB Scoping Plan No Action Taken Scenario which assumes the site would be developed without implementation of conceptual design features and using regulations in place at the time of the Scoping Plan development. The R&D Variant shows large reductions in GHG emissions due to the mitigation measures that will be implemented. The comparison of the R&D Variant GHG emissions to the ARB Scoping Plan No Action Taken scenario is shown in Table IV-18 (Annual GHG

Emissions Comparison of R&D Variant and ARB Scoping Plan No Action Taken Scenario). This shows that due to the improvement in electricity carbon intensity and energy efficiency of the buildings residential GHG emissions would have a 20 percent reduction in emissions and non-residential buildings would have a 17 percent reduction in emissions. Municipal sources are anticipated to be 7 percent lower than the ARB Scoping Plan No Action Taken as a result of reductions in electricity carbon intensity. Mobile source emissions associated with the R&D variant are a result of trip reductions in automobiles and vehicle emission efficiency regulations resulting in 57 percent reductions compared to the ARB Scoping Plan No Action Taken scenario.

Table IV-17 R&D Variant Annual GHG Emissions

Source	*Candlestick Point (tonnes CO_2e/year)*	*Hunters Point Shipyard Phase II (tonnes CO_2e/year)*	*Total (tonnes CO_2e/year)*
Residential	19,035	6,642	25,677
Non-Residential	4,263	23,155	27,418
Mobile	77,586	42,332	119,918
Municipal	1,793	860	2,653
Area	161	56	217
Waste	532	506	1,038
Transit Area	865	865	1,730
Total (annual emissions)	***104,234***	***74,416***	***178,651***

SOURCE: ENVIRON, 2009.

Table IV-18 Annual GHG Emissions Comparison of R&D Variant and ARB Scoping Plan No Action Taken Scenario (tonnes CO_2e/year)

Source	*No Action Taken*	*R&D Variant*	*Difference*	*Percent Difference*
Residential	32,286	25,677	6,609	20%
Non-Residential	33,025	27,418	5,607	17%
Mobile	277,459	119,918	157,541	57%
Municipal	2,860	2,653	207	7%
Area	217	217	0	0%
Waste	1,038	1,038	0	0%
Transit Service	2,884	1,730	1,154	40%

SOURCE: ENVIRON October 2009. Climate Change Technical Report Candlestick Point-Hunters Point Shipyard Phase II Redevelopment Plan. Table 4-9 (Appendix S to this EIR)

Emissions associated with new public transportation added to the development would have a 40 percent reduction due to the use of diesel-hybrid buses. Since transportation is one of the largest emissions categories in both the statewide and local GHG emissions inventory, the amount of reduction is substantial in the overall reductions anticipated for the R&D Variant. Furthermore, most of the other larger categories also result in substantial reductions in emissions. This indicates that the R&D Variant would not impede the achievement of San Francisco's GHG emission reduction ordinance nor the statewide emission reductions required under AB 32. Therefore, the R&D Variant is less than significant with respect to the cumulative impacts of climate change and GHG emissions.

BAAQMD Draft GHG Thresholds

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Variant's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the Variant and Project.

With mitigation, the R&D Variant-related operational emissions of 178,651 tonnes per year result in 4.4 tonnes CO_2e per service population per year based on a service population of 40,507 (this accounts for 23,869 net new residents and all 16,638 jobs). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change.

IV.C VARIANT 2: HOUSING VARIANT (NO STADIUM—RELOCATION OF HOUSING)

IV.C.1 Overview

The Housing Variant assumes that the 49ers Stadium would not be constructed, and instead, housing would be relocated to the HPS Phase II site. Residential development would be reduced at Candlestick Point and increased at HPS Phase II in comparison to the Project, and the total 10,500 housing units would be the same as with the Project. All other uses on Candlestick Point and HPS Phase II would be constructed at the same locations and at the same intensities proposed with the Project. Neighborhood retail would be distributed differently than the Project to serve residential uses on HPS South district; however, the total amount of neighborhood retail is the same as the Project. Parks and sports field areas at HPS Phase II would be increased compared to the Project because the total development area for residential uses would be reduced.

Table IV-19 (Housing Variant Land Use Summary) presents the land use summary for the Housing Variant. Figure IV-7 (Housing Variant Land Use Plan) illustrates the proposed Housing Variant land uses.

Table IV-19 Housing Variant Land Use Summary

Land Use	*Candlestick Point*	*HPS Phase II*	*Total*
Residential			
Residential Density Range I (15 to 75 units per acre)	970	1,540	2,510
Residential Density Range II (50 to 125 units per acre)	3,670	1.905	5,575
Residential Density Range III (100 to 175 units per acre)	1,220	265	1,485
Residential Density Range IV (175 to 285 units per acre)	640	290	930
Total (units)	***6,500[a]***	***4,000[b]***	***10,500***
Retail			
Regional Retail (gsf)	635,000	N/A	635,000
Neighborhood Retail (gsf)	125,000	125,000	250,000
Total (gsf)	***760,000***	***125,000***	***885,000***
Office (gsf)	150,000	N/A	150,000
Research & Development	***N/A***	***2,500,000***	***2,500,000***
Hotel (gsf)	150,000	N/A	150,000
Rooms	220	N/A	220
Artists' Studios/Art Center (gsf)	N/A	255,000	255,000
Community Services (gsf)[c]	50,000	50,000	100,000
Parks & Open Space			
New Parks (acres)	8.1	149.9	158.0

Table IV-19 Housing Variant Land Use Summary

Land Use	*Candlestick Point*	*HPS Phase II*	*Total*
New Dual-Use Sports Fields/Multi-Use Lawn and Stadium Parking and Waterfront Recreation (acres)	N/A	94.7	94.7
Existing State Parkland Improved (acres)	91.0	N/A	91.0
New State Parkland (acres)	5.7	N/A	5.7
Total (acres)	***104.8***	***244.6[d]***	***349.4***
Marina (slips)	N/A	300	300
Performance Venue/Arena (gsf)	75,000	N/A	75,000
Seats	10,000	N/A	10,000
Parking (spaces)			
Residential (structured)	6,500	4,000[e]	10,500
Commercial (structured)	2,346	3,778	6,124
General and Commercial (on-street)	1,360	1,298	2,658

SOURCE: Lennar Urban, 2009.

a. 1,350 units less than the Project (moved to HPS Phase II).

b. 1,350 units more than the Project (moved from Candlestick Point).

c. . Community facilities parcels are intended to provide the existing BVHP community and the future Project community with dedicated land for uses designed to provide, preserve, and leverage such critical local resources as social services, education, the arts, other community services (including public safety facilities such as fire and police stations), and facilities for the benefit of senior citizens. Additional uses proposed for the community facilities parcels such as retail, services, offices, and R&D space, beyond the 100,000 proposed for community facilities, would be absorbed within the retail or R&D program proposed in HPS Phase II. Total uses would not exceed those amounts identified in this table.

d. Parks and sports field areas at HPS Phase II would be increased compared to the Project because the total development area for residential uses would be reduced.

e. Residential parking at HPS Phase II would be increased compared to the Project to provide parking for the additional residential units.

IV.C.2 Project Objectives

The objectives for the Housing Variant would be the same as for the Project. In particular, the Housing Variant was prepared to address the following portion of Objective 1:

- Implement the CP-HPS Development Plan with public benefits, whether or not the 49ers decide to remain in San Francisco, including developing alternate uses for the stadium site on the Shipyard Property that are consistent with the overall CP-HPS Development Plan objectives.

A full list of Project objectives is provided in Section II.D of this EIR.



SOURCE: Lennar Urban, 2009.

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FIGURE IV-7 Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING VARIANT LAND USE PLAN

IV.C.3 Characteristics

Section II.E outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. While many of these components of the Project would also apply to this variant, the discussion below outlines the principal differences.

Candlestick Point

The land use program outlined in the Chapter II for Candlestick Point would be the same for this Housing Variant, with fewer housing units. The discussion below is focused on the changes that would occur at HPS Phase II.

Districts

As discussed in Chapter II, the HPS Phase II land use plan would consist of four districts: the HPS Village Center, HPS North, R&D, and HPS South. The changes proposed with the Housing Variant compared to the Project include residential and neighborhood commercial land uses for the HPS South district and a small reduction in neighborhood commercial uses in other HPS Phase II districts. All other land uses within the HPS Phase II districts would be the same as the Project, as described in detail in Chapter II. Land uses on the Candlestick Point site would be the same as with the Project, however the density of residential uses would be lower. A summary of the development in HPS Phase II proposed with the Housing Variant is provided in Table IV-20 (Housing Variant HPS Phase II Land Use Summary). Figure IV-8 (Housing Variant Maximum Building Heights) illustrates the maximum building heights for the Housing Variant.

The Hunters Point Shipyard South

With the Housing Variant, the 69,000-seat National Football League stadium proposed with the Project would not be constructed. Instead, the Housing Variant would result in construction of 1,350 dwelling units at Density Range I and II in the HPS South district. The Project includes no residential uses in this district. In addition, with Variant 2, the HPS South district would develop 25,000 gsf of neighborhood retail, while the Project would not develop any neighborhood retail adjacent to the stadium. As presented in Table IV-21 (Housing Variant HPS Phase II Parks and Open Space), the Sports Field Complex proposed with the Housing Variant would be 65.9 acres, 6.2 acres more than the Project.

Hunters Point Shipyard North

Other than the amount of neighborhood retail that would be developed, the land uses proposed in the HPS North district are the same as the Project. Development in this area would include 18,000 gsf of neighborhood retail uses, which is 7,000 gsf less than what is proposed for the Project.

Hunters Point Shipyard Village Center

Other than the amount of neighborhood retail that would be developed, the land uses proposed in the HPS Village Center district would be the same as the Project. Development in this area would include 20,000 gsf of neighborhood retail uses, this is 5,000 gsf less than what is proposed for the Project.

Table IV-20 Housing Variant HPS Phase II Land Use Summary

District	*Net Acres*[a]	*Dwelling Units*[b]	*Density*	*Neighborhood Retail (gsf)*	*Artist Space (gsf)*	*R&D (gsf)*	*Community Services (gsf)*	*Total Commercial (gsf)*	*City Parks (acres)*
Hunters Point Shipyard North	27.30	2,085	I, II, III, IV	18,000[c]	0	0	0	18,000	19.9
Hunters Point Shipyard Village Center	7.55	125	I	20,000[d]	255,000	0	0	275,000	15.6
Research & Development	26.22	440	I, II	62,000[e]	0	2,000,000	0	2,062,000	25.3
Hunters Point Shipyard South	47.06[f]	1,350[g]	I, II	25,000[h]	0	500,000	50,000	575,000	183.8
Total	***108.13***	***4,000***[g]	***N/A***	***125,000***	***255,000***	***2,500,000***	***50,000***	***2,930,000***	***244.6***[i]

SOURCE: Lennar Urban, 2009.

a. Net Acreage excludes the street network.

b. 1,540 Residential Density Range I (15 to 75 units per net acre)
1,905 Residential Density Range II (50 to 125 units per net acre)
265 Residential Density Range III (100 to 175 units per net acre)
290 Residential Density Range IV (175 to 285 units per net acre)
4,000 Total units

c. 7,000 gsf less than the Project.

d. 5,000 gsf less than the Project.

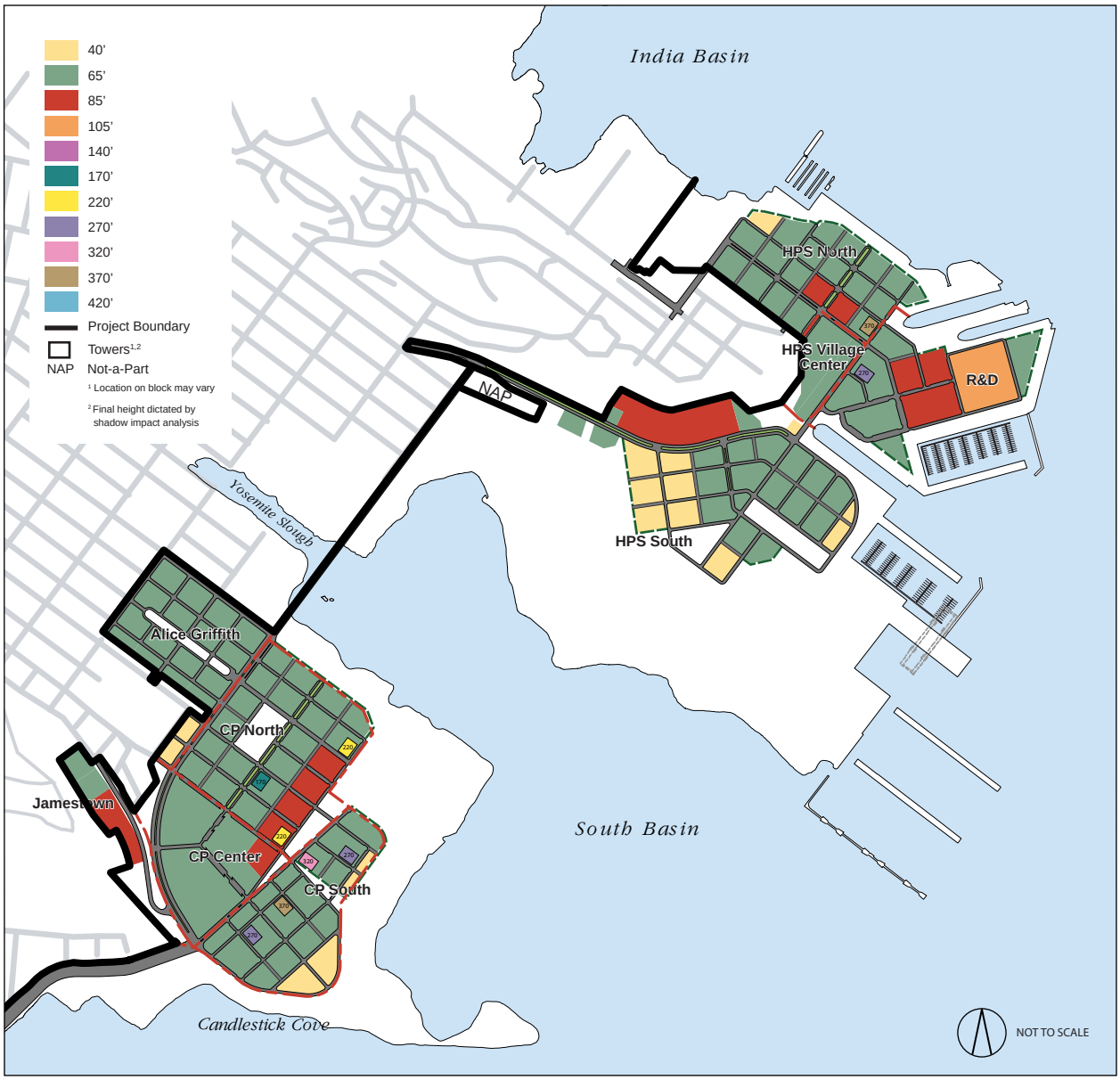
e. 13,000 gsf less than the Project.

f. The net acreage of the HPS South district would be increased compared to the Project (32.26 acres with stadium).

g. 1,350 units more than the Project.

h. 25,000 more than the Project.

i. Parks and sports field areas at HPS Phase II would be increased compared to the Project because the total development area for residential uses would be reduced.



SOURCE: Lennar Urban, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING VARIANT MAXIMUM BUILDING HEIGHTS

FIGURE IV-8

Table IV-21 Housing Variant HPS Phase II Parks and Open Space

Park/Open Space		*Acres*
New Parks		
Northside Park		12.8
Waterfront Promenade		32.4
Heritage Park		15.6
Grasslands Ecology Park at Parcel E		44.9
Grasslands Ecology Park at Parcel E-2		37.7
Hunters Point South Park		3.7
	Subtotal	*2.8*
New Sports Fields and Active Urban Recreation		***149.9***
Sports Field Complex		
Multi-Use Lawn		65.9
Waterfront Recreation & Event Pier		22.1
	Subtotal	*6.7*
	Total	***94.7***
	Project Total	***244.6***

SOURCE: Lennar Urban 2009.

Research & Development

Other than the amount of neighborhood retail that would be developed, the land uses proposed in the R&D district are the same as the Project. The R&D district would include 62,000 gsf of neighborhood retail uses, 13,000 gsf less than what is proposed with the Project.

Parks and Open Space at HPS Phase II

The Housing Variant parks and open space on Candlestick Point would be the same as the Project; this discussion focuses on HPS Phase II changes. The Housing Variant would include additional parks and would reconfigure the design and sizes of parks and open space areas at HPS Phase II compared to the Project. HPS Phase II would have 244.6 acres (13 acres more than the Project) of parks and open space. The Sports Field Complex proposed with the Housing Variant would be 65.9 acres, which is 6.2 acres more than proposed with the Project. An additional 6.5 acres of parks not included in the Project would be constructed in the HPS South The 4.4-acre Hunters Point South Park would be constructed in the HPS South district, which is not included in the Project. Table IV-21 presents the proposed park and open space at HPS Phase II in the Housing Variant. Figure IV-9 (Housing Variant Parks and Open Space) illustrates the location of the proposed parks and open space.



SOURCE: Lennar Urban, RHAA, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING VARIANT PARKS AND OPEN SPACE

FIGURE IV-9

Transportation and Circulation

A new Yosemite Slough bridge serving transit, bike, and pedestrian traffic only would extend Arelious Walker Drive from Candlestick Point to HPS Phase II. The additional four auto lanes on the bridge to serve game-day traffic, proposed with the Project, are not included in this variant. The bridge would be approximately 40 feet wide and would cross the Slough at the same location as the Project. The bridge and its approach streets would have two dedicated transit lanes and a separate Class I bicycle and pedestrian lane, which would be open at all times.

The primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas Avenue to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.

At HPS Phase II, additional roadways to serve the residential uses on HPS South would be included and residential parking would be increased to serve the additional residential units, compared to the Project.

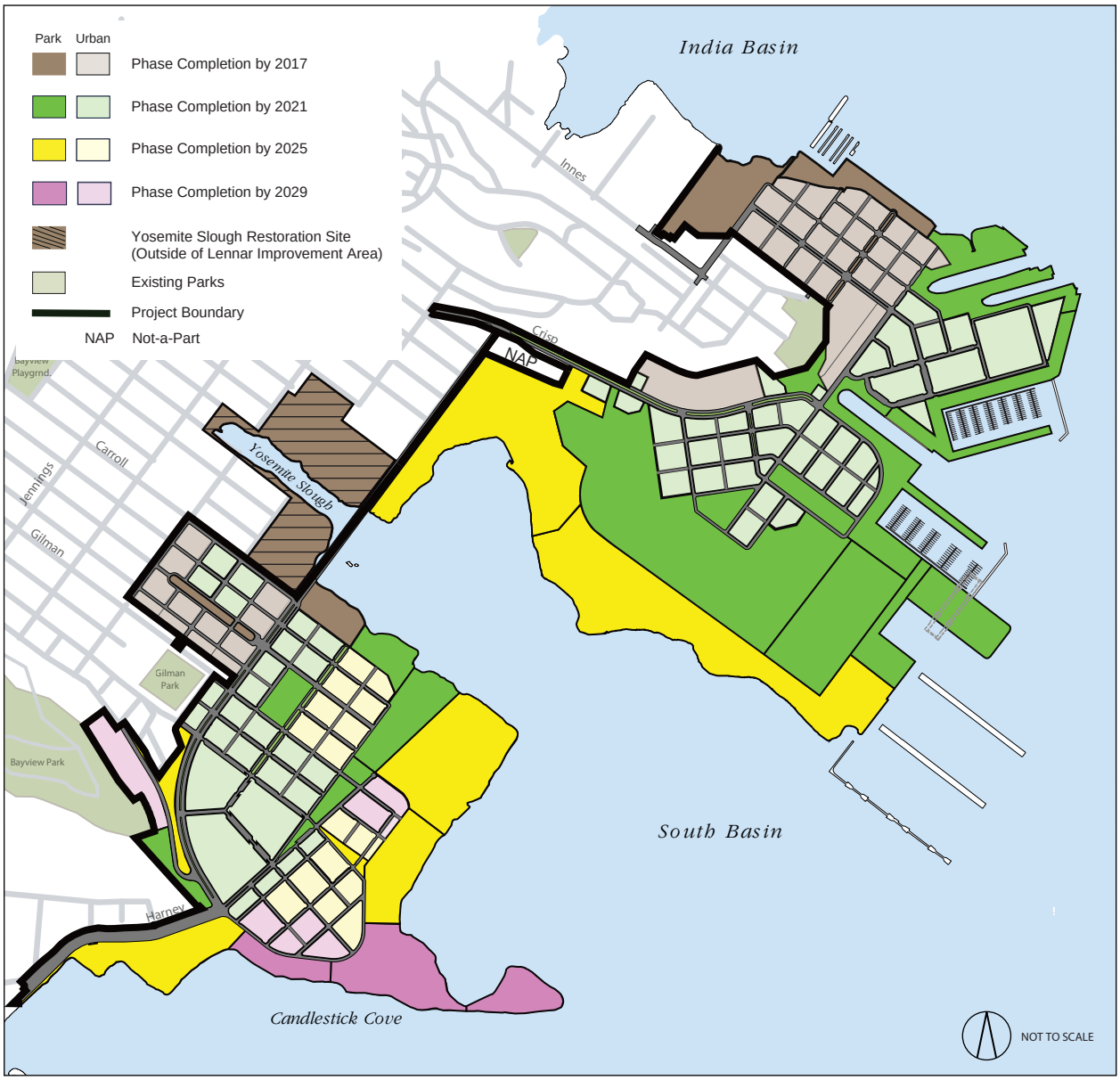
Infrastructure

The location of major infrastructure improvements would be very similar to that which is proposed for the Project but rather than terminating at the stadium site, the improvements would be sited under the roadways of HPS South. Stormwater treatment methods are designed for site-specific conditions and have been identified for the Housing Variant and are discussed below.[1230]

Implementation

- Residential development at HPS Phase II would begin in 2012 with completion in 2023. Figure IV-10 (Housing Variant Building and Parks Construction Schedule) illustrates the overall phasing for the Housing Variant.

[1230] Arup, *Candlestick Point/Hunters Point Shipyard LID Stormwater Opportunities Study*, August 2009.



SOURCE: Lennar Urban, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

FIGURE IV-10

HOUSING VARIANT BUILDING AND PARKS CONSTRUCTION SCHEDULE

IV.C.4 Potential Environmental Effects

Overall, the Housing Variant would not increase the total amount of development as compared to the Project but rather would remove the 69,000-seat football stadium from the development plan and relocate 1,350 housing units from the Candlestick Point site to the HPS Phase II site. As such, in a general context, the Housing Variant includes all uses proposed with the Project with the exception of the stadium area, which would be replaced by the relocated housing units. With the exception of the fewer housing units at Candlestick Point, all characteristics of Candlestick Point would be the same as the Project. This analysis focuses on the changes that would occur at HPS Phase II. Thus, potential construction-related environmental effects of the Housing Variant would be substantially similar to the Project because the development programs are substantially similar, with the exception of the removal of the football stadium, and construction activities would, in general be the same. Potential operational effects of the Housing Variant would be substantially similar to the Project because the football stadium proposed with the Project was only proposed to be used for 12 games, and 20 other events, a year. Further, operational impacts would be primarily related to the day-to-day activities of residential dwelling units, not because there would be an increased number but rather because their location would be different.

Land Use and Plans

As shown in Figure IV-7, the Housing Variant would remove the stadium proposed with the Project and relocate 1,350 residential dwelling units from Candlestick Point to HPS Phase II. This would have the potential to increase land use impacts at the site as removal of the stadium from the land use program could conflict with existing applicable land use plans.

Division of an Established Community

The Project site generally includes underutilized and vacant parcels with limited access to the Bay shoreline and CPSRA. Connectivity between the Bayview Hunters Point neighborhood, Candlestick Point and HPS Phase II is limited. Large parking lots and vacant parcels at Candlestick Point separate the Bayview Hunters Point neighborhood from the Bay shoreline, and primary access roads do not include pedestrian, transit or bicycle features. Access to HPS Phase II is restricted to certain areas (those areas used for artist studios), and the area remains isolated from surrounding neighborhoods. The Housing Variant would maintain residential communities at Alice Griffith public housing and at Jamestown Avenue, similar to the Project.

- The Housing Variant (Variant 2) proposes infill development, centered on nodes of commercial and retail activity at Candlestick Point and HPS Phase II with no physical divisions. Residential and non-residential infill around these nodes of activity would provide a more continuous land use pattern and street grid, provide new services and community amenities in the Bayview Hunters Point neighborhood, allow better access to parks and recreational facilities (which would be improved under the Housing Variant), and remove existing barriers to circulation and access. There are five privately owned parcels on Candlestick Point that the Applicant seeks to acquire for the development, including one block on Jamestown Avenue in the Jamestown District (currently vacant) and four contiguous parcels in the Candlestick Point North District (either vacant or containing an RV park). If these private parcels are not acquired by the Applicant, they would be permitted under the BVHP Redevelopment Plan and the Planning Code to develop via an Owner Participation Agreement (OPA) in a manner that is consistent with the BVHP Redevelopment Plan

or would be allowed to operate as an existing non-conforming use. For those parcels that are currently developed, or for any of the parcels if they develop via an OPA, that development would be included in the overall total development that would occur on the Project site. The total amount of development under this variant would not change; that is, the Applicant's development on the remaining portion of the site plus any development under separate OPAs as envisioned under the Housing Variant would result in the same overall development level as proposed by the Applicant. The Housing Variant (Variant 2) would not divide an established community; therefore, no impact would occur, similar to the Project.

Consistency with Plans and Policies

Applicable plans that direct or regulate development on the Project site include the San Francisco General Plan, Candlestick Point State Recreation Area General Plan, San Francisco Bay Plan, San Francisco Bay Trail Plan, Bay Area Seaport Plan, Bayview Hunters Point Area Plan, Bayview Hunters Point Redevelopment Plan, Hunters Point Shipyard Redevelopment Plan, and San Francisco Planning Code. San Francisco's Sustainability Plan also applies to the Housing Variant. While the Housing Variant is generally consistent with goals and objectives of most plans, the Housing Variant would be inconsistent with land use designations that reflect former economic realities or former plans for the site. These inconsistencies would require amendments to the relevant plans, but do not reflect any impacts to the environment that the plans and policies seek to avoid. As described in connection with the Bay Plan and Seaport Plan, the designation of industrial uses along the waterfront is not a policy adopted to protect the environment, and the Housing Variant's proposals for this land represent an environmental improvement. Inconsistencies regarding the development pattern at HPS and the uses on Candlestick Point simply reflect the shifting locations of proposed uses within the site. The Housing Variant's proposed changes in the arrangement of land uses would not implicate any environmental protection objectives of the current land use designations in the redevelopment plans and other applicable land use plans; thus, the inconsistencies do not give rise to a significant impact on the environment, similar to the Project.

Change to the Land Use Character

The Housing Variant would alter the land use character at the Project site with new development of residential uses, R&D uses, regional and neighborhood retail uses, an arena, and public open space in the same proportions as the Project and without the stadium use. The Housing Variant's would extend the existing street grid and block pattern into HPS Phase II. The open space network would connect to the shoreline to the north and south.

This development would be considered to improve the existing land use conditions, and would not have an adverse effect on land use character of the Project site itself.

The Housing Variant would result in a substantially different built environment compared to the existing character of the site and vicinity. With the transition in scale and uses, the extension of the existing street grid, and with the connectivity of new open space with existing shoreline open space, the Housing Variant would be compatible with surrounding land uses. The Housing Variant would not result in a substantial adverse change in the existing land use character at the Project site or vicinity, and overall density would be less than the Project. The impact would be less than significant, similar to the Project.

Population, Housing, and Employment

In general, impacts from the Housing Variant would be similar to the Project because land uses and densities are substantially the same, with the exception of removal of the football stadium.

As shown in Figure IV-7, the Housing Variant would remove the football stadium from the development plan and relocate 1,350 housing units from the Candlestick Point site to the HPS Phase II site. However, the Housing Variant would not increase the number of residential units, nor other land uses. As such, the Housing Variant would have the potential to reduce the number of employment opportunities (both construction and operational) at the site over levels anticipated with the Project, as discussed below. However, the permanent residential population would not change.

Direct Impacts

- With the Housing Variant (Variant 2), the first phase of construction is scheduled for completion in 2019, extending through 2031, a period of approximately 12 years. This is similar to the construction schedule proposed at the HPS Phase II site for the Project, and, therefore, the number of construction personnel required at any given time at the HPS Phase II site would be similar to the total projected to be required for the Project. Construction employment opportunities are temporary in nature and would not result in a substantial increase in the number of employees in the area. Therefore, the Housing Variant would result in a less-than-significant impact to population during construction.

Direct population growth with the Housing Variant would include residents and employees who would occupy new homes and the employment space(s), respectively. With the Housing Variant, the football stadium proposed with the Project would be removed from the development plan and 1,350 housing units would be relocated from Candlestick Point to HPS Phase II. There would be no change to the number of proposed housing units; therefore, the permanent resident population with the Housing Variant would be the same as with the Project. However, the Housing Variant would reduce the number of jobs compared to the Project due to the removal of the stadium and no additional employment opportunities would be created. The Housing Variant would result in approximately 10,378 jobs. Total employment with the Housing Variant would represent approximately 1.4 percent of the 748,100 jobs anticipated Citywide in 2030. Overall, development with the Housing Variant would be less intensive than the Project.

Although the Housing Variant would result in a decrease in employment at the HPS Phase II site, growth in this area has long been the subject of many planning activities. The Housing Variant would provide all on-site infrastructure for connections to City mains, and would include on-site treatment of stormwater runoff. Therefore, the relocation of the housing units would not encourage growth where appropriate infrastructure would not be available.

Employment growth at HPS Phase II would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. The Housing Variant would not alter the number of housing units proposed with the Project although it would relocate 1,350 housing units from Candlestick Point to HPS Phase II. Additionally, there would be a net decrease in jobs, which would mean that the Housing Variant would result in a less-than-significant impact than the Project. Total demand for housing with the Housing Variant would represent 3.7 percent of the total Bay Area housing need of

Table IV-22 Housing Variant Employment by Land Use

Land Use	*Employment Factor*[a]	*Development Program, Candlestick Point*[b]	*Employment, Candlestick Point (jobs)*	*Development Program, HPS Phase II*[b]	*Employment, HPS Phase II (jobs)*	*Total Employment (jobs)*
Residential	25 units/job	6,500 units	260	4,000 units	160	420
Regional Retail	350 gsf/job	635,000 gsf	1,814	0 gsf	—	1,814
Neighborhood Retail	270 gsf/job	125,000 gsf	463	125,000 gsf	463	926
Office	276 gsf/job	150,000 gsf	543	0 gsf	—	543
Research and Development	400 gsf/job	0 gsf	—	2,500,000 gsf	6,250	6,250
Hotel	700 gsf/job	150,000 gsf	214	0 gsf	—	214
Arena/Performance Venue	300 jobs/event[c]	150 events/year[c]	87	0 events	—	87
Public Parking	270 spaces/job[e]	3,706[e]	14	5,076 [e]	19	33
Parks and Open Space	0.26 jobs/acre[f]	104.8[g]	27	244.6[g]	64	91
Total			***3,422***		***7,008***	***10,378***[h]
Project Total						***10,730***

SOURCES: Economic and Planning Systems, Inc., *Fiscal Analysis of the Candlestick Point/Hunters Point Shipyard Redevelopment Project*, 2009.

a. Employment factors are from City and County of San Francisco, *Transportation Impact Analysis Guidelines*, October 2002.
b. Based on buildout floor areas provided in Table II-2 of this EIR, Chapter II for Candlestick Point, and on Table IV-19 for HPS Phase II.
c. Lennar Urban, LLC estimates that there would be approximately 150 events at the arena annually and that employees would work 4-hour shifts.
d. Employment factors for public parking facilities provided by Economic and Planning Systems, Inc., 2009.
e. Parking based on Table IV-19 of this EIR, Chapter II. Includes Commercial (structured) and General and Commercial (on street). Residential parking at HPS Phase II would be increased compared to the Project to provide parking for the relocated Residential space.
f. Employment factors for parks and open space provided by Economic and Planning Systems, Inc., 2009.
g. Open space acreages based on Table II-2 of this EIR, Chapter II for Candlestick Point, and on Table IV-21 for HPS Phase II.
h. While Project employment includes 359 stadium jobs, the Housing Variant also includes 1 net new job related to public parking, and six net new jobs related to parks; therefore, the difference between the Project and the Housing Variant is 359 - 1 - 6 = 352 net jobs.

214,500 units (based on the Regional Housing Needs Assessment (RHNA) targets; refer to Section III.C.3 projected by ABAG through 2014.[1231] Based on the total employment available with the Housing Variant (10,378 jobs), total housing demand would be 7,990 units.[1232] As discussed above, the Housing Variant would provide approximately 10,500 dwelling units. This would exceed the approximately 7,990 dwelling unit demand anticipated with the Housing Variant. Therefore, the population increase associated with employment with the Housing Variant could be entirely accommodated. However, it is likely that some employees with the Housing Variant would elect to live elsewhere in the City or within surrounding Bay Area communities.

Based on existing commuting patterns, the Housing Variant would generate a demand for about 3,596 units in surrounding Bay Area communities. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that the increase in employment with the Housing Variant would create a substantial demand for housing in the immediate neighborhood, in San Francisco, or in the region in excess of the housing provided as part of the Housing Variant or housing otherwise available in the Bay Area. Necessary improvements to infrastructure, public services, and housing associated with direct population growth proposed as part of the Housing Variant has been anticipated in ongoing local and regional planning activities. All impacts associated with direct population growth are considered less than significant, similar to the Project.

Indirect Impacts

As infrastructure, public services, roads, and other services and communities amenities are expanded, there would also be potential for development with the Housing Variant to generate indirect population growth. Indirect growth is often defined as "leapfrog" development, development that occurs as infrastructure is expanded to previously un-served areas. Such development patterns usually occur in suburban areas adjacent to undeveloped lands. Areas surrounding the Housing Variant site are built out, except for sites such as Executive Park or India Basin that are currently undergoing development or are the subject of planned future development. Thus, the surrounding lands are not vulnerable to leapfrog-type development.

Infrastructure and services would be expanded to serve both the Candlestick Point and HPS Phase II sites, without significant excess capacity that might encourage additional local growth beyond that already anticipated under Proposition G and with the redevelopment plans. Development with the Housing Variant would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. All impacts associated with indirect population growth are considered less than significant, similar to the Project.

The potential for impacts due to housing displacement would be substantially similar to the Project. The Housing Variant would not increase residential units proposed with the Project. However, any dwelling units removed with the Housing Variant would be replaced on site by the proposed development and no residents would be displaced, necessitating the construction of replacement housing elsewhere. There would be no impact, similar to the Project.

[1231] The RHNP is updated every five years and does not extend through 2030.
[1232] Calculated as the projected employment divided by 1.36, plus 4.7% additional housing units to account for vacancy rate, times 55% total demand in San Francisco.

Transportation and Circulation

Overall, the Housing Variant would not increase the total amount of development compared to the Project but would relocate approximately 1,350 housing units from Candlestick Point to HPS Phase II. Therefore, 4,000 residential units (rather than 2,650 residential units) would be developed at HPS Phase II. The Housing Variant would include all uses proposed with the Project with the exception of the stadium, which would be replaced by the relocated housing units. There would be no football stadium. Therefore, the Housing Variant would not have game day or other stadium event transportation impacts associated with the Project. The Housing Variant would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with the Project, including the Yosemite Slough bridge. However, the bridge would be narrower than the bridge with the Project, with a 39-foot-wide right-of-way to accommodate two 11-foot-wide BRT lanes, a sidewalk, and a Class I bicycle path.

The Housing Variant would include a Transportation System Management plan and would develop and implement a Transportation Demand Management plan, as with the Project.

The Transportation Study analyzed the Housing Variant and conclusions from the Transportation Study have been presented below.

Construction Impacts

Construction activities associated with the Housing Variant would be similar to the Project. Depending on the phasing of the additional development, the Housing Variant may result in fewer construction traffic impacts between future years 2012 and 2017 when the new stadium would be constructed, and somewhat greater impacts in the years the housing would be constructed. Implementation of a Construction Traffic Management Program (the same as described for the Project) would help minimize the Housing Variant's contribution to cumulative construction-related traffic impacts. However, localized construction-related traffic impacts would therefore remain significant and unavoidable.

The Housing Variant would have 218,989 total daily person trips, fewer than the trips generated with the Project (219,651). Similarly, the Housing Variant would generate fewer peak hour person trips during both the AM and PM peak hours (13,489 weekday AM trips, 20,359 weekday PM trips, and 18,121 Sunday PM trips).

Intersection LOS

The Housing Variant would have similar project and cumulative effects at most study intersections as would occur with the Project; only cumulative impacts at the intersections of Cesar Chavez/Evans and Bayshore/Oakdale would worsen as compared to the Project. Section III.D discusses traffic effects at those intersections and the feasibility of mitigation measures. As noted in Impact TR-3, Impact TR-4, Impact TR-5, Impact TR-6, and Impact TR-8, Project intersection impacts would be significant and unavoidable. Those conclusions would apply as well to the Housing Variant. Like the R&D Variant, the Housing Variant would contribute to cumulative traffic in the 2030 condition at Cesar Chavez/Evans and cause intersection operating conditions at Bayshore/Oakdale to worsen in the PM peak hour from LOS C under 2030 conditions to LOS E. No feasible mitigation exists for either intersection and the Housing Variant's contribution to cumulative impacts would be significant and unavoidable.

Traffic spillover effects with the Housing Variant would be significant and unavoidable, as with the Project.

Freeway Conditions

The Housing Variant effects on freeway mainline sections would be similar to the Project, although the magnitude of impacts may be greater with the Housing Variant due to increased traffic generation compared to the Project. Therefore, the Housing Variant-related and cumulative effects freeway operating conditions on this segment would be considered significant and unavoidable.

The Housing Variant effects on freeway ramp junctions would be similar to the Project, although the magnitude of impacts may be greater with the Housing Variant due to increased traffic generation compared to the Project. As described for Project impacts, no feasible mitigation measures have been identified for future freeway ramp junction conditions. Therefore, the Housing Variant contribution to freeway ramp operating conditions would be considered significant and unavoidable.

The Housing Variant ramp queuing effects would be similar to Project effects. The Housing Variant would result in significant impacts with respect to ramp queuing at the same off-ramp locations as the Project, with one exception. With the Housing Variant, the US-101 northbound off-ramp to Harney Way would not be likely to experience queues extending back to the mainline in the PM peak hour. However, the Housing Variant's contribution to other off-ramps expected to experience significant traffic impacts associated with queuing under Project conditions would be the same as the Project. As described for Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant impacts. Therefore, the Housing Variant's contribution to freeway segments operating at LOS E or LOS F conditions would be considered significant and unavoidable.

Transit Impacts

The Housing Variant, as with the Project, would include extended and new transit services; transit trips with the Housing Variant would be accommodated within the capacity of these services. The Housing Variant, as with the Project, would have a less than significant impact with mitigation on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with the Housing Variant would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. Project mitigation measures MM TR-21 to MM TR-30 would also apply to the Housing Variant, but as concluded in Section III.D, the feasibility or implementation of the measures is uncertain, and the transit delay effects would remain significant and unavoidable.

The Housing Variant would require a similar number of additional vehicles on the same routes as the Project to mitigate transit congestion delays.

Bicycle Impacts

The Housing Variant bicycle trips would be accommodated within the proposed street and network, and impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The Housing Variant would be accommodated within the proposed sidewalk and pedestrian network, and impacts on pedestrian circulation would be less than significant.

Parking Impacts

The Housing Variant would result in a demand for about 21,310 spaces, compared with a maximum permitted supply of about 16,624 spaces; therefore, the maximum off-street parking supply would be about 4,686 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. Due to parking supply constraints and accessibility to transit, future Housing Variant parking demand may be somewhat lower than estimated, and therefore the parking space shortfall would also be less than represent the number of spaces that would be required in order to accommodate all the vehicles anticipated if the proposed parking supply was unconstrained. Since the parking supply would be constrained, the actual parking demand would be expected to be less. As discussed in Section III.D, peak parking demand would not represent do not occur simultaneously; public parking facilities, such as the one proposed in Candlestick Point, and on-street parking spaces can usually be shared efficiently among many destinations; and the Housing Variant would include a Travel Demand Management program that includes a number of parking strategies to make auto use and ownership less attractive, as well as strategies to encourage alternative modes.

As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. Parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact under CEQA, but rather a social effect. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Housing Variant impacts on parking would be less than significant.

- The Housing Variant would have the same arena-related transportation effects as with the Project, that is, significant and unavoidable impacts on traffic and transit operations, except that, like the R&D Variant, the impact to transit operations would be caused by traffic congestion (as for the Project) and by possibly added transit demand. As for the R&D Variant, this possible effect would be reduced by having SFMTA increase the frequency on regularly scheduled Muni routes (primarily the CPX-Candlestick Express) serving the arena area prior to large events at the arena and having the arena operator provide additional shuttle service to key regional transit destinations, such as BART, Caltrain, and the T-Third light-rail route. Implementation of this mitigation and MM TR-23.1 would reduce but not avoid significant impacts on transit operations. Also as for the Project and the R&D Variant, implementation of mitigation measure MM TR-41 (Transportation Management Plan for the arena) would reduce but not avoid significant impacts on traffic.

  The Housing Variant would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

In general, impacts from the Housing Variant would be similar to the Project because land uses and densities are substantially the same, with the exception of elimination of the proposed football stadium.

The Housing Variant would not increase the number of residential units or other land uses. Construction impacts would be substantially similar to the Project because the overall proposed uses and necessary activities would be the same as with the Project. Operational impacts would be similar but less than those identified with the Project, as the proposed residential buildings would be lower in height than the proposed stadium. All other urban design and building forms with the Housing Variant, and resulting effects, would be similar to conditions with the Project. Furthermore, the density of the residential areas across both the Candlestick Point and HPS Phase II sites would be lowered.

Construction

- As noted above, construction impacts of the Housing Variant (Variant 2) on the visual character of the area would be similar to the Project because construction practices and activities would be similar for similar types of construction. Construction of the housing on the proposed stadium site would occur later in the 20-year building period than construction of the stadium under the Project. Construction activities would occur throughout the 702-acre Housing Variant site over the build-out period, ending in 2031. Visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. In addition, temporary structures could be located on the site during various stages of demolition or construction, within materials storage areas, or associated with construction debris piles on and off site. Exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates would be visible for the proposed utilities and infrastructure improvements, as well as for roadway improvements. Although these activities would take place primarily within the Housing Variant site, they would be visible to surrounding land uses. However, these visual conditions would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Further, temporary conditions (e.g., bulldozers, trenching equipment, generators, trucks, etc.) associated with construction would not result in obstruction of a scenic vista, as construction equipment is not tall enough to interfere with views of the Bay, the East Bay hills, or the San Francisco downtown skyline. The Housing Variant site is not located within a state scenic highway. The only scenic resources on or near the site are the CPSRA, the Re-gunning crane, Yosemite Slough, the shoreline, the Bay, San Bruno Mountain, and Bayview Hill. There are no rock outcroppings or major areas of landscaping on the site, although some ruderal vegetation would be removed. Construction of the Housing Variant would not affect the Re-gunning crane, which would remain intact after implementation of the Housing Variant. Therefore, construction activities would have a less-than-significant impact on scenic vistas and scenic resources, similar to the Project. Mitigation measure MM AE-2 (Mitigation for Visual Character/Quality Impacts during Construction) would further reduce potential impacts to the visual character of the area.

Construction impacts of the Housing Variant to light and glare would be similar to the Project because proposed uses and materials would be the same. Construction would occur during daylight hours, generally between 7:00 A.M. and 8:00 P.M. or as otherwise allowed by the City. A minimal amount of glare could result from reflection of sunlight off windows of trucks, but this would be negligible and would not affect daytime views in the area. Security lighting would be provided after hours on all construction sites, but this

lighting would be minimal, restricted to the Housing Variant site, and would not exceed the level of existing night lighting levels in urban areas. In addition, construction lighting would comply with any City of San Francisco lighting requirements. Therefore, construction activities would have a less-than-significant impact due to light and glare, similar to the Project.

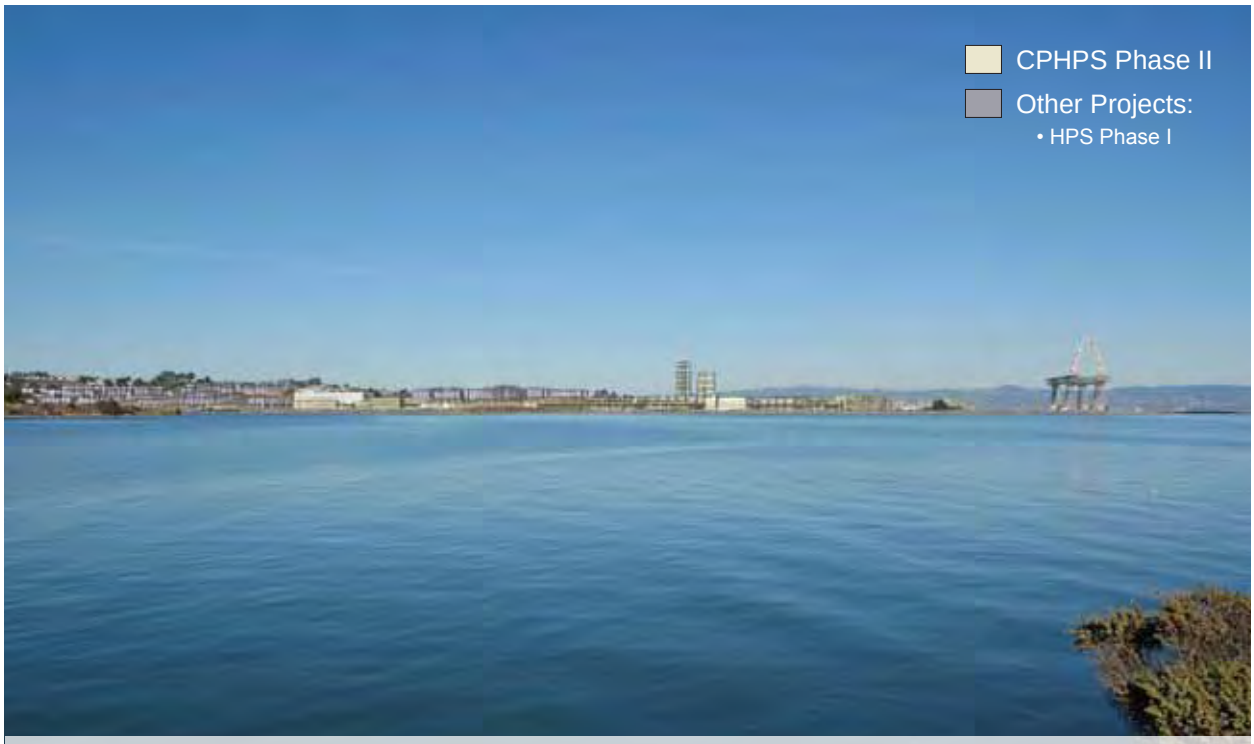
Operation

Operational impacts to views would be substantially similar to, if not less than, the Project because the residential buildings would have heights lower than the average height of the football stadium and would have the benefit of architectural treatment (Figure IV-11 [Housing Variant Northeast from CPSRA]). With the Housing Variant, the stadium proposed with the Project would be removed from the development plan and 1,350 dwelling units would be relocated from the Candlestick Point site to the HPS Phase II site. On the HPS Phase II site, the proposed 69,000-seat 49ers stadium was to be 156 feet tall (about 15 stories) above the adjacent playing field. Residential buildings proposed with the Housing Variant at HPS South would vary in height from 40 to 65 feet, depending on location with buildings immediately adjacent to the proposed recreational facilities (primarily the multi-use field) being 40 feet tall. Even at the maximum 65 feet tall, the residential building would be a minimum of approximately 90 feet below the heights proposed with the Project. Although the Project would not substantially obstruct any views into the area, views would be less obstructed than with the Project. The area surrounding the additional new residential uses would be developed with new open space to the west, south, and east, and by new R&D uses to the north. With respect to adjacent neighborhoods, the HPS Phase II North district would be south of the India Basin neighborhood (Figure IV-12 [Housing Variant South from Hilltop Open Space]). Therefore, development with the Housing Variant would result in a less-than-significant impact due to obstruction of a view or scenic vista, similar to the Project. Even though relocation of 1,350 dwelling units out of Candlestick Point would take place with the Housing Variant, the majority of buildings in Candlestick Point would remain 65 feet. However, the number and location of towers would be reduced. For example, in the CP North area, the Housing Variant includes two 220-foot towers as opposed to five towers ranging from 170 feet to 270 feet. Similarly, in CP South, the Housing Variant proposes six towers (four, 270-foot towers; one 320-foot tower; and one 370-foot tower) compared to the six with the Project (two residential towers up to 370 feet, one tower up to 420 feet, one tower up to 270 feet, and two with maximum heights up to 320 feet). Building heights within the blocks along the eastern side of CP North would be reduced from a maximum of 140 feet to 85 feet. Additionally, as in HPS Phase II, these buildings constructed with the Housing Variant would have the benefit of architectural treatment. As such, views into the area would be less obstructed than with the Project and the Housing Variant would result in a less-than-significant impact due to obstruction of a view or scenic resource.

Development of the Housing Variant would have substantially similar impacts to the Project regarding the potential for damaging scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting because design of the proposed residential buildings would be of appropriate height, massing, and architectural treatment. With the Housing Variant, the football stadium proposed with the Project would be removed from the development plan and 1,350 dwelling units would be relocated from Candlestick Point to HPS Phase II. At the HPS Phase II site, the Housing Variant would continue to remove old, deteriorating structures associated with ship repair, piers, dry-docks, storage, and administrative uses and replace these structures



Existing



Proposed

SOURCE: Lennar Urban, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE IV-11

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING VARIANT NORTHEAST FROM CPSRA





SOURCE: Lennar Urban, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE IV-12

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING VARIANT SOUTH FROM HILLTOP OPEN SPACE

with new development. Currently, the HPS Phase II site contains limited landscaping and is primarily a degraded industrial setting. Bayview Hill, located on the Candlestick Point site, is a prominent scenic resource for HPS Phase II and would remain intact with the Housing Variant development with the exception of close-in vantage points, which may be altered. However, with the Housing Variant, proposed heights in the area of the former stadium would range from 40 to 65 feet, substantially lower than the proposed 156-foot maximum height of the football stadium. Furthermore, the Housing Variant would retain structures at the potential HPS Drydock Historic District, as well as the Re-gunning crane, a highly visible landmark. Development of the HPS Phase II site with the Housing Variant would also include about 349 acres of new and renovated parkland, open space, and sports fields, with improved public access, thereby improving the scenic quality of the area (13 acres more than the Project would provide). The Housing Variant site is not located within a state scenic highway. Therefore, development at the HPS Phase II site would not have significant adverse impacts on scenic resources or other features that contribute to a scenic public setting, and the impact would be less than significant. Additionally, the Housing Variant would not substantially degrade the visual quality or character of the Housing Variant site or its surroundings and the impact would be less than significant, similar to the Project.

The Housing Variant would not include the field lighting and other night-time lighting associated with the 49ers stadium. The Housing Variant would have way-finding, security, and street lighting associated with similar residential uses and the adjacent R&D uses to the north of the HPS South area as well as other development at HPS Phase II. The Housing Variant would not interfere with any existing views of the night sky from across the Bay, nor would glare affect those viewers, similar to the Project. New sources of light associated residential uses during the evening could result from the Housing Variant, which would provide lesser impacts than the football stadium proposed with the Project. Impacts of the Housing Variant would be substantially similar to or less than the Project and would result in a less-than-significant impact. Incorporation of mitigation measures MM AE-7a.1 (parking lot lighting), MM AE-7a.2 (landscape and sign illumination), MM AE-7a.3 (lighting plan), and MM AE-7a.4 (non-reflective materials) would further reduce potential impacts.

Shadows

As shown in Figure IV-7, the Housing Variant would replace the 156-foot-high football stadium proposed under the Project with 1,350 housing units relocated from Candlestick Point in 40- and 65-foot-high structures. As the proposed new residential buildings at HPS Phase II would be lower in height than the stadium, and as the height of residential towers at Candlestick Point would be reduced, shade impacts would be less than the project.

Construction

As with the Project, construction activities of the Housing Variant would not result in shadow effects on open space.

Operation

As shown in Figure IV-8, the Housing Variant would replace the 49ers stadium (up to 156 feet high) with housing buildings of 40 and 65 feet high in the Hunters Point Shipyard South district. As a result of the relocation of housing units from Candlestick Point to the Hunters Point Shipyard South district, several of the residential towers at Candlestick Point would be reduced in height.

All other land use and building heights in the Hunters Point Shipyard North, Hunters Point Shipyard Village Center, and the R&D districts would be the same as with the Project. HPS Phase II would include new open space at Grasslands Ecology Park, Sports Fields, and Multi-Use Lawn at Hunters Point Shipyard South, the Waterfront Recreation Pier, the Waterfront Promenade, Heritage Park, and Northside Park. However, the Housing Variant would have a different configuration of open space at Hunters Point Shipyard South than the Project. Refer to Figure IV-7.

For this variant, development at Candlestick Point would result in new structures with the potential to cast shadows on existing or proposed parks and open space. However, these shadows would not substantially affect outdoor recreation facilities or other public areas and impacts would be less than significant. As the height of some residential towers at Candlestick Point would be reduced compared to the Project, shade impacts at Candlestick Point would be less than the Project.

As the building heights and land uses at Hunters Point Shipyard North, Hunters Point Shipyard Village Center, and the R&D districts would be the same for the Housing Variant as the Project, development at those locations would not add shade year round to existing public open space, including India Basin Shoreline Park and India Basin Open Space.

During morning and mid-day periods from September through March, the Housing Variant would have similar shading effects as the Project, on Grasslands Ecology Park near Crisp Road, Heritage Park, and Hillside Parks and Open Space. In mid-afternoon, the Housing Variant would shade the Waterfront Promenade. During summer months, the Housing Variant would result in shade on Grasslands Ecology Park near Crisp Road, Heritage Park, and Hillside Open Space.

All other shadow effects at HPS Phase II, including Northside Park, would be the same as with the Project. Shadow effects would be the same at Candlestick Point.

Although the Housing Variant would cast shadows on recreational and open space, it would not substantially affect outdoor recreation facilities or other public areas or have an adverse effect on the use of the open space and impacts would be less than significant. As the height of structures would be reduced in the Hunters Point Shipyard South district, shade impacts would be slightly less than Project.

Wind

As shown in Figure IV-8, the Housing Variant would replace the 156-foot-tall football stadium with 40- and 65-foot-tall residential units in HPS South. Additionally, the number and height of towers in Candlestick Point would be reduced thereby reducing the potential for wind impacts.

Construction

Construction activities of the Housing Variant would not result in additional wind impacts, similar to the Project. Impacts such as fugitive dust emissions and erosion from wind are addressed in Section III.H and Section III.M.

Operation

Building structures near or greater than 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 mph equivalent wind speed for a single hour of the year would be exceeded. There is no threshold height that triggers the need for wind-tunnel testing to determine whether the building design would result in street-level winds that exceed the standard. It is generally understood, however, from wind-tunnel testing on a variety of projects in San Francisco, that most, if not all, buildings under 100 feet do not result in adverse wind effects at street level barring unusual circumstances.

For the Housing Variant, the height of some residential towers at Candlestick Point would be reduced, however most are likely to exceed 100 feet in height. Thus development at Candlestick Point would result in new structures with the potential generate winds that could affect ground-level pedestrian spaces. Implementation of mitigation measure MM W-1a (Building Design Wind Analysis), which would require a design review process for buildings greater than 100 feet in height, and if determined to be necessary, inclusion of a design criteria to reduce pedestrian-level impacts, would reduce impacts to a less than significant level. As the height of towers would be reduced, impacts would be less than the project.

As shown in Figure IV-8, residential buildings in the Housing Variant would replace the 156-foot-high stadium with residential buildings ranging from 40 to 65 feet. As such, the residential uses at HPS Phase II would not exceed 100 feet in height and would not result in adverse wind effects. As the Housing Variant would not include any structures exceeding 100 feet in height at HPS Phase II, impacts would be less than the Project.

Air Quality

As shown in Figure IV-7, the Housing Variant removes the stadium proposed under the Project and relocated 1,350 residential dwelling units from Candlestick Point to HPS Phase II. Other than the stadium site, land uses provided with a Housing Variant would be the same as the Project. As land uses would remain the same, the potential air quality impacts would be the virtually same as the Project; however, as the construction housing in place of the stadium would require fewer equipment, impacts from emissions associated with construction activities would be reduced. Operational impacts would be similar but greater than those identified under the Project as the proposed additional residential development would result in greater daily criteria pollutant emissions than the stadium.

Construction

- As stated above, overall construction impacts of the Housing Variant (Variant 2) with respect to air quality would be similar to the Project. Construction activities would occur throughout the 702-acre Housing Variant site over the approximately 20-year build-out period ending in 2031, with the construction of the additional dwelling units occurring between 2019 and 2023. Similar to the Project, construction activities under the Housing Variant would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures,

use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

With respect to construction emissions, construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. However, the BAAQMD does not recommend any significance thresholds for the emissions during construction. Instead, the BAAQMD bases the criteria on a consideration of the mitigation measures to be implemented. If all appropriate emissions mitigation measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, construction emissions are not considered adverse. Fine particulate matter (PM_{10}) is the pollutant of greatest concern with respect to construction activities.[1233] Any project within the City of San Francisco, including the Housing Variant, would be required to comply with *San Francisco Health Code* Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). As such, with implementation of mitigation MM HZ-15, which identifies specific mitigation measures that would be used to reduce emissions associated with construction, impacts would be less than significant, similar to the Project.

With respect to airborne human health risks, construction activities associated with the Housing Variant would increase the levels of two potential human health risks: (1) diesel particulate matter (DPM) and (2) dust or particulate matter (PM_{10}) bound to certain metals and/or organic compounds from on-site soils. MM AQ-2.1 (Implement Accelerated Emission Control Device Installation on Construction Equipment) and MM AQ-2.2 (Implement Accelerated Emission Control Device Installation on Construction Equipment Used for Alice Griffith Parcels) would address construction sources of DPM including off-road construction equipment such as lifts, loaders, excavators, dozers, and graders. In addition, the delivery of equipment and construction materials, spoils and debris hauling, and employee commute traffic could contribute to construction-related DPM emissions. In terms of DPM, ENVIRON prepared a human health risk assessment (HRA)[1234] that evaluated potential human health risks associated with construction and operation of the Project quantitatively and the proposed variants qualitatively, including the Housing Variant. As construction emissions associated with the Housing Variant are expected to be lower than those associated with construction of a stadium in the same location (e.g., Project), the Housing Variant would have lower impacts than the Project.

The HRA evaluated potential impacts to numerous receptors (off-site residents, off-site workers, off-site students, and on-site residents) in and around the Project. BAAQMD CEQA Guidelines have an established threshold of 10 in one million for carcinogenic health risks; the HRA concluded that the inhalation cancer risk at the MEI would be 4.5 in one million. This represents the maximum level of DPM experienced by all off-site and on-site (i.e., Alice Griffith) sensitive receptors during Project construction activities. Exposure to DPM from construction activities associated with the Project would not exceed the threshold. The Housing Variant is not anticipated to exceed Project impacts and therefore would not exceed the BAAQMD CEQA threshold. In addition, the HRA concluded the maximum chronic noncancer HI to be 0.01, which is below the BAAQMD's significance threshold of 1.0.

[1233] BAAQMD. 1999. *BAAQMD CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*. December.
[1234] Environ. 2009. Ambient Air Quality Human Health Risk Assessment: Candlestick Point – Hunters Point Shipyard Phase II Development Plan. October. Appendices I & II. (Appendix S to this EIR)

As the carcinogenic and non-carcinogenic health risks posed by DPM emissions during construction activities associated with development of the Housing Variant have been determined to be below established thresholds, this impact is less than significant with MM AQ-2.1 and MM AQ-2.2, similar to the Project.

Construction activities at both Candlestick Point and HPS Phase II have the potential to generate TACs associated with soil-PM_{10} and an HRA evaluated the potential concentrations of the airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult and child residents, workers, and schoolchildren) in the Project vicinity.

As noted above, BAAQMD has an established threshold of 10 in 1 million for carcinogenic health risks; the inhalation cancer risk at the point of maximum impact or MEI as a result of construction activities at the Project would be 0.04 in one million. This represents the maximum level of PM_{10} experienced by all sensitive receptors in and around the Project during construction activities. Exposure to soil-PM_{10} from construction activities associated with Candlestick Point would not exceed the threshold. The Housing Variant is not anticipated to exceed Project impacts and therefore would not exceed the BAAQMD CEQA threshold. In addition, the HRA concluded the maximum non-cancer HI to be 0.03, which would be below the BAAQMD's significance threshold of 1.0.

As the carcinogenic and noncarcinogenic health risks posed by soil-PM_{10} emissions during construction activities associated with development of HPS Phase II have been determined to be below established thresholds, this impact is less than significant with MM HZ-15, similar to the Project.

Operation

Operational impacts to regional and local air quality would be substantially similar to the Project. Development at Candlestick Point would remain the same as under the Project and impacts would be the same as identified under the Project. Under the Housing Variant, the football stadium proposed under the Project would be replaced with 1,350 residential units redistributed from Candlestick Point to HPS Phase II. Due to the redistribution of uses under this variant, approximately 908 additional vehicle trips over that of the Project would occur and thereby result in a higher level of daily VMT than the Project. As such, the level of emissions anticipated under the Housing Variant would be greater than the Project, as shown in Table IV-23 (Housing Variant Operational Criteria Pollutant Emissions [Year 2030]). The difference in daily criteria pollutants would increase under this variant compared to the Project by 1 to 2 percent, depending on the criteria pollutant evaluated.

However, both this variant and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. The Housing Variant, similar to the Project, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. The Housing Variant's transportation analysis estimates that a similar Housing development that did not include the trip reduction features of the Housing Variant would generate 136,868 daily external motor vehicle trips (about 73 percent more than the Housing Variant's daily external motor vehicle trips). The comparison of the Housing Variant to a similar level of development under "business as usual" conditions is also shown in Table IV-23.

Table IV-23 Housing Variant Operational Criteria Pollutant Emissions (Year 2030)

Scenario/Emission Source	*ROG (lbs/day)*	*NO_X (lbs/day)*	*CO (lbs/day)*	*PM_{10} (lbs/day)*	*$PM_{2.5}$ (lbs/day)*
Hunters Point Shipyard					
Area[a]	242	49	38	2	2
Motor Vehicles (External)	98	88	1,002	462	87
Subtotal	*340*	*136*	*1,040*	*464*	*89*
Candlestick Point					
Area[a]	373	60	45	3	3
Motor Vehicles (External)	210	191	2,174	1,004	189
Subtotal	*583*	*250*	*2,219*	*1,007*	*192*
All Development Sites					
Area[a]	616	108	83	5	5
Motor Vehicles (External)	308	278	3,177	1,466	276
Motor Vehicles (Internal)	30	13	229	45	9
All Sources (Variant 1)	***953***	***400***	***3,489***	***1,516***	***290***
Comparison to Proposed Project	***101%***	***102%***	***102%***	***102%***	***102%***
Change from Proposed Project	*1%*	*2%*	*2%*	*2%*	*2%*
Comparison to Business as Usual	***87%***	***68%***	***65%***	***59%***	***60%***
Reduction from Business as Usual	*-13%*	*-32%*	*-35%*	*-41%*	*-40%*
All Development Sites (Business as Usual)					
Area[a]	616	108	83	5	5
Motor Vehicles	485	476	5,292	2,561	481
All Sources (Business as Usual)	***1,101***	***585***	***5,375***	***2,566***	***486***
Comparison to Variant 1	***115%***	***146%***	***154%***	***169%***	***168%***

SOURCE: PBS&J, 2009. Based on URBEMIS 2007 Version 9.2.4.

Daily emissions of ROG and NO_X were calculated under Summer conditions when ambient ozone concentrations are highest. Daily emissions of CO, PM_{10}, and $PM_{2.5}$ were calculated under winter conditions when associated ambient concentrations are highest.

* Area emissions are from sources located on the project site, such as natural gas combustion for heating/cooling, maintenance equipment, consumer product use, etc.

Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10} and $PM_{2.5}$ associated with land uses anticipated under the Housing Variant would exceed existing BAAQMD thresholds. Under BAAQMD's current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project, no additional feasible mitigation measures are available to would reduce the Housing Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact. It should be noted that, as stated above, although the significance under this variant would be similar to the Project, criteria pollutant emissions associated with the operation of uses under the Housing Variant would be greater than the Project, as stated in Table IV-23.

With respect to airborne human health risks, emissions associated with operation activities under the Housing Variant would increase the levels of two potential human health risks: (1) TACs and (2) vehicle

emissions ($PM_{2.5}$). Under the Housing Variant, dwelling units would be relocated from CP to the HPS Phase II area.

This Housing Variant continues to include R&D facilities at HPS Phase II, which are situated on a peninsula extending to the east of the proposed additional housing and south of other proposed residential areas. As the predominant winds are out of the west, on-site receptors will generally be upwind from these R&D areas. As such, the Project is designed to minimize potential adverse impacts between TAC sources in R&D areas and both on-site and off-site receptors. As discussed for the R&D Variant, an analysis was conducted to determine the potential impacts from a variety of TAC sources in the R&D areas. Details regarding this assessment can be found in Appendix H1, Attachment III.[1235]

The HRA estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. As the Housing Variant has the same configuration as the Project, the estimated cancer risks for long-term residential exposure would be above 10 in one million in an area designated as open space that would extend slightly south beyond the R&D boundary. The maximum estimated cancer risk for a residential receptor in this location would be 17 in one million; the noncarcinogenic health risks would have an HI of 1.7. However, as noted above, this receptor location would be in an area designated as open space, and would not be a residential location. If cancer risks were estimated based on exposure assumptions consistent with recreational use of the open space, the risks would be reduced well below the threshold of 10 in one million. Due to the decrease in the frequency and duration of potential exposures, the chronic HI would also be reduced below the HI threshold of 1.0.

The estimated health risks would be below BAAQMD thresholds for all residential receptor locations as a result of implementation of the Project. As such, impacts would be less than significant with implementation of MM AQ-6.1 and MM AQ-6.2 developed for the Project and also required for the Housing Variant.

- In terms of human health risks associated with vehicle emissions, vehicle emissions along local roadways would shift location with development of the Housing Variant (Variant 2), as some residential units will be relocated from Candlestick Point to HPS Phase II. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the Housing Variant (Variant 2) were estimated at selected roadways and compared against the 0.2 μg/m3 action level to determine the potential health risks on receptors attributed to vehicle emissions from the Housing Variant (Variant 2). Several roadway segments were chosen based on whether Project-related traffic would use these streets to access neighboring freeways and other areas of San Francisco and/or currently or would experience significant truck traffic. The roadways chosen include:
  - Third Street
  - Innes Avenue/Hunters Point Boulevard/Evans Avenue
  - Palou Avenue
  - Gilman Avenue/Paul Avenue
  - Harney Way

[1235] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

- Jamestown Avenue
- Ingerson Avenue

- With the addition of Variant-related traffic, no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of 0.2 $\mu g/m^3$ action level.[1236] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

Noise and Vibration

As shown in Figure IV-7, the Housing Variant remove the stadium proposed under the Project and relocated 1,350 residential dwelling units from Candlestick Point to HPS Phase II. Other than the stadium site, land uses provided with a Housing Variant would be the same as the Project. As land uses would remain the same, the potential noise impacts would be the same as the Project with the exception that the noise impact from operation of the stadium would not occur under the Housing Variant.

Construction activities for a Housing Variant would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the Housing Variant, but not to a less-than-significant level as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a Housing Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a Housing Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a Housing Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Noise level increases associated with the Housing Variant are shown in Table IV-24

[1236] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Appendix IV, May 4, 2010.

(Housing Variant Modeled Traffic Noise Levels along Major Project Site Access Roads). Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. However, the Housing Variant would have slightly lower noise levels than the Project along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, but would still be significant, as shown in the table. Measures available to address significant traffic noise increases in these residential areas are limited. As the ultimate feasibility and implementation of the noise insulation measures that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City as the lead agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable.

Because the Housing Variant would not include a football stadium, noise impacts identified for the Project from football games and concerts would not occur with implementation of the Housing Variant.

The Housing Variant site is not located within an airport land use plan area or near a private airstrip. Furthermore, the Housing Variant does not include an aviation component. Therefore, a Housing Variant will not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Table IV-24 Housing Variant Modeled Traffic Noise Levels along Major Project Site Access Roads

Roadway	*Land Use*	*Existing Noise Level*	*2030 Without Project*	*2030 With Project*	*2030 With Housing Variant*	*Variant-Related Increase*	*Allowable Increase*	*Significant Impact?*
Innes north of Carroll Avenue	Residential	53.3	60.9	60.9	60.9	0	2	No
3rd Street south of Carroll Avenue	Residential	62.8	67.3	68.3	68.3	1.0	1	No
Cesar Chavez Boulevard west of 3rd Street	Residential	59	63.5	63.5	63.5	0	2	No
Palou Avenue east of 3rd Street	Residential	56.8	61.6	62.1	62.1	0.5	2	No
Ingalls Street north of Carroll Avenue	Residential	56.7	61.7	63.1	63.1	1.4	2	No
Carroll Avenue east of 3rd Street	Residential	**52.6**	**53.8**	**58.1**	**57.9**	**4.1**	**3**	**Yes**
Gilman Avenue east of 3rd Street	Residential	**57.7**	**60.6**	**64.6**	**64.5**	**3.9**	**2**	**Yes**
Jamestown Avenue north of Harney Way	Residential	**51.4**	**55.5**	**61.2**	**61.0**	**5.5**	**5**	**Yes**
Harney Way west of Jamestown Avenue	Residential	52.6	59	59.6	59.6	0.6	3	No
Bayshore Boulevard north of Visitacion	Residential	65.1	68.5	68.6	68.7	0.2	1	No

SOURCE: PBS&J, 2009. Based on URBEMIS 2007 Version 9.2.4.

Daily emissions of ROG and NO_x were calculated under Summer conditions when ambient ozone concentrations are highest. Daily emissions of CO, PM_{10}, and $PM_{2.5}$ were calculated under winter conditions when associated ambient concentrations are highest.

* Area emissions are from sources located on the project site, such as natural gas combustion for heating/cooling, maintenance equipment, consumer product use, etc.

Cultural Resources and Paleontological Resources

As shown in Figure IV-7, the Housing Variant would remove the football stadium from the land use program of the Project and 1,350 dwelling units would be relocated from Candlestick Point to HPS Phase II. Both construction and operational impacts would be substantially similar to the Project because construction activities as well as the area and type of land disturbance would be similar. Additionally, the types of land use and associated activities are similar and were all analyzed in the initial land program.

Potential impacts to paleontological resources with the Housing Variant would be substantially similar to the Project and less than significant with mitigation because the amount and type of land disturbance activities (including subterranean development) would be similar. Although no fossils have been reported at the Candlestick Point or HPS Phase II sites, the presence of Franciscan sedimentary rocks (shanstone, shale, chert, and greenstone) on the flanks of Hunters Point indicates the possibility of fossils being discovered during construction-related excavation. Additionally, the presence of Bay mud under the fill around Hunters Point indicates the possibility of fossils being discovered during construction-related excavation. However, mitigation measure MM CP-3a (paleontological resources) would reduce the effects of construction-related activities to paleontological resources to a less-than-significant level by mitigating for the permanent loss of the adversely affected resources through implementation of a *Paleontological Resources Monitoring and Mitigation Program*. Therefore, the Housing Variant would result in a less-than-significant impact to paleontological resources during construction activities, similar to the Project.

Potential impacts to archaeological resources with the Housing Variant would be substantially similar to the Project and less than significant with mitigation because the amount and type of land disturbance activities (including subterranean development) would be similar. Records indicate that prehistoric archaeological sites are located within the HPS Phase II site, including CA-SFR-9, CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14. Previous archaeological investigations have shown that prehistoric archaeological sites in the HPS Phase II site tend to be located along the original shoreline. Hunters Point had numerous maritime-related industries, including dry docks and boarding houses. In addition, there were several historically documented large offshore "rocks" that presented navigational hazards. Therefore, it is possible that buried shipwrecks may occur within the HPS Phase II site and construction activities may encounter previously unknown archaeological resources. Mitigation measure MM CP-2a (archaeological resources) would reduce the effects of construction-related activities to the archaeological resources in the HPS Phase II site to a less-than-significant level by mitigating for the permanent loss of the adversely affected archaeological resources through implementation of the *Archaeological Research Design and Treatment Plan for the Bayview Waterfront Project, San Francisco, California*. Therefore, the Housing Variant would result in a less-than-significant impact to archaeological resources during construction activities, similar to the Project.

At Candlestick Point, potential archaeological resources expected to be found could have important research value and would, therefore, be legally significant under CEQA. Examples of research themes that have been proposed to which expected archaeological resources could contribute significant data include: the spatial organization and historical development of Chinese fishing camps; effects, adaptations; and resistance of the fishing camps to anti-Chinese fishing legislation (1885–1930s); spatial organization of shipyards, development of local traditions of boat building technology, including that of the scow schooner and Chinese junks; the development; changing function; and inter-settlement relationships of prehistoric

shell mounds; comparative spatial organization of shell mound sites; changes in prehistoric faunal and biotic exploitation practices; prehistoric changes in social stratification; relationship between Hunters Point-Bayview and South of Market area prehistoric settlements. Any potential archeological resources, e.g., fishing camps, that are covered by existing development would remain covered and unavailable unless the site is redeveloped. While the development footprint at Candlestick Point is not proposed to change from what was analyzed for the Project, in the event that archaeological resources are discovered at Candlestick Point, MM CP-2 (archaeological resources, Candlestick Point) would reduce potential impacts to a less-than-significant level.

Historical resources at HPS Phase II include the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District, with buildings, structures, and objects associated with the area's "transition from early commercial dry dock operation to high tech naval repair and Radiological research and waste treatment facility."[1237] Contributing resources in the Hunters Point Historic District include Drydock 2, Drydock 3, and Buildings 140, 204, 205, 207, 208, 211, 224, 231, and 253.

- As with the Project, development at HPS Phase II with the Housing Variant (Variant 2) would result in the demolition of Buildings 211, 224, 231, and 253, which have been determined eligible as contributors to the California Register of Historic Resources (CRHR)–eligible Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. While the land use changes with the Housing Variant would not affect the HPS Phase II area within that potential historic district, implementation of the Housing Variant as a whole would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Implementation of mitigation measure MM CP-1b.1 and MM CP-1b.2 (historical resources) would reduce but not avoid the significant adverse impact. As with the Project, the impact on historical resources with the Housing Variant would remain significant and unavoidable.

Operational activities anticipated with the Housing Variant would not differ substantially from the Project because neither would include ground-disturbing activities that would accelerate the potential deterioration of cultural resources. While 1,350 residential dwelling units at Candlestick Point would be relocated to HPS Phase II and the density of residential uses at Candlestick Point overall would be reduce, no comprehensive changes to the land use program within Candlestick Point would be made. These activities would not have the potential to adversely disturb paleontological, archaeological, or historical resources. Therefore, the Housing Variant would result in no impact to these resources, similar to the Project.

Hazards and Hazardous Materials

The building footprint of the Housing Variant would be less than the Project, as the same number of dwelling units would be constructed and the stadium would be eliminated. Construction activities associated with the Housing Variant would: disturb soil and/or groundwater; result in the handling, stockpiling, and transport of soil; involve demolition or renovation of existing structures that could include asbestos-containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury; expose construction workers to hazardous materials; be a source of hazardous air emissions within one-quarter mile of an existing or planned

[1237] Circa Historic Property Development, *Hunters Point Commercial Dry Dock and Naval Shipyard Historic District DPR form*, October 31, 2008.

school; and encounter soils or groundwater that contains contaminants from historic uses that could pose a human health or environmental risk if not properly managed. Each of these impacts for the Housing Variant would be slightly less than for the Project, and, similar to the Project, would be reduced to a less-than-significant level with implementation of the identified mitigation measures (MM HY-1a.2, MM HZ-1a, MM HZ-1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM HY-1a.1, MM HY-1a.3, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4).

Construction of the Housing Variant would require improvements to existing utility infrastructure and installation of new underground utilities, which could expose construction workers, the public, or the environment to hazardous materials. However, with the implementation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, which require remediation of any contaminated soils, the hazards risk from potential exposure to contaminated soil or groundwater during construction would be reduced to a less-than-significant level, similar to the Project. In addition, mitigation measure MM HZ-2a.2 requires the preparation of a site-specific health and safety plan, which would further ensure that all risks to workers, residents, or the public would be reduced to less than significant, the same as for the Project.

The Housing Variant would require pile supports for the residential towers, the same as the Project. This construction activity could result in groundwater contamination from disturbed soils. Mitigation measure MM HZ-5a would reduce this impact by requiring a foundation support piles installation plan, which would verify that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. With implementation of this mitigation measure, the impact from potential groundwater contamination would be reduced to a less-than-significant level, the same as for the Project.

Shoreline improvements would occur under the Housing Variant the same as for the Project. Shoreline improvements would require concurrence of BCDC, San Francisco RWQCB, and USACE. That permit would contain numerous conditions to ensure that the construction activities are conducted in a manner that is protective of aquatic resources. Mitigation measure MM HZ-10b requires that all shoreline activities that could affect sediment (or in the case of the Navy-installed cover and riprap at Parcel E/E-2) be conducted in accordance with agency-approved remedial design documents, applicable health and safety plans, DCPs, or any other documents or plans required under applicable law or laws, including but not limited to applicable requirements shown in Table III.K-2. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts. For Candlestick Point, impacts would be mitigated through mitigation measures MM HY-1a.1 and MM HY-1a.2. With implementation of these mitigation measures, along with applicable regulations and permits, potential impacts related to exposure to hazardous materials releases from contaminated sediments that could be disturbed during proposed shoreline improvements would be reduced to a less-than-significant level for the Housing Variant, the same as for the Project.

Similar to the Project, remediation activities conducted on behalf of the City or developer in conjunction with development activities at HPS Phase II parcels transferred prior to completion of remediation in an "early transfer" would disturb soil and/or groundwater that may contain contaminants from historic uses. The identified mitigation measure (MM HZ-12) would require the SFDPH to ensure that before development occurs, the Agency or the developer and their contractors have incorporated all applicable

requirements into remedial design documents, work plans, health and safety plans, DCPs and any other document or plan required under the AOC or other applicable law, as a condition of development. As a result of these controls and mitigation measure, the potential impact of exposure to hazardous materials during remediation activities conducted on behalf of the Agency or the developer in conjunction with development of HPS Phase II under the Housing Variant would be reduced to less-than-significant levels.

The Housing Variant would place housing on the HPS Phase II site. The Navy's cleanup plan is designed to remediate the HPS site to levels acceptable for the planned uses in the existing HPS Redevelopment Plan. To the extent that the Housing Variant proposes to place housing in areas not designated for residential use in the existing HPS Redevelopment Plan, additional hazardous materials remedial work could be required, which could result in some increased risk to workers, the public and environment from exposure to hazardous materials during the construction process. Any property that has not been remediated for unrestricted use at the time of transfer will have use restrictions placed on the property in compliance with the federal clean-up process. For use restrictions to be removed, the Project Applicant would be required by the transfer documents to obtain approval from the regulatory agencies overseeing the clean-up process before residential uses could be placed on these portions of the site. Any remedial activities undertaken as part of the construction process would be subject to the requirements in MM HZ-1b, which requires construction activities at HPS Phase II to be done in accordance with all restrictions imposed on the site by the federal regulatory clean-up process and these impacts would be less than significant, the same as for the Project.

In addition to uncovering hazardous materials within the existing buildings, construction and grading activities associated with the Housing Variant could disturb soil or rock that is a source of naturally occurring asbestos, which could present a human health hazard. As discussed, above, the Housing Variant includes somewhat less excavation and construction than that anticipated under the Project. Similar to the Project, with the implementation of mitigation measure MM HZ-15, which requires preparation of an asbestos dust mitigation plan, this impact would be reduced to a less-than-significant level.

As with the Project, the Bret Harte Elementary School and Muhammad University of Islam elementary schools are located within one-quarter mile of the development area of the Housing Variant. Consistent with the discussion above, the Housing Variant could uncover asbestos-containing materials (naturally or in existing building materials) or other hazardous materials during construction, consistent with the Project. However, with incorporation of mitigation measures MM HZ-1a, MM HZ-1b, MM HZ-2a.1, and MM HZ-15, any impacts to these schools would be reduced to a less-than-significant level, similar to the Project.

After development of the Housing Variant, periodic maintenance could require excavation of site soils to maintain or replace utilities, repair foundations, or make other subsurface repairs which could expose hazardous materials. Implementation of mitigation measures MM HZ-1a and HZ-1b would require remediation of any contaminated soils pursuant to the appropriate regulations. MM HZ-2a.1 would require the development of an unknown contaminant contingency plan to describe procedures to follow in the event unexpected contamination is encountered during construction activities, including procedures for ensuring compliance with the above laws and regulations. Additionally, mitigation measure MM HZ-2a.2 would require the preparation and implementation of a site-specific HASP in compliance with federal and state OSHA regulations and other applicable laws. The general requirements of mitigation measure MM HZ-9 would require that the Agency or its contractor or Project Applicant shall comply with all

requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent for any properties subject to early transfer (prior to full Navy remediation). To reduce this impact related to exposure to hazardous materials releases that have not been fully remediated at HPS Phase II. Mitigation measure MM HZ-9 further requires that all work on the Yosemite Slough bridge would comply with Navy work plans for construction and remediation on Navy-owned property. Implementation of these mitigation measures would reduce this impact to a less-than-significant level, same as for the Project.

The Housing Variant would replace the proposed stadium at HPS Phase II with housing. This would result in a similar amount of hazardous materials being used compared to a stadium use. The Housing Variant would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, the same as for the Project. Maintenance products used under the Housing Variant would be incrementally small, and would not increase the risk from handling these materials. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. The Housing Variant would comply with applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials in accordance with applicable federal and State laws and impacts would be less than significant.

Hazardous materials would routinely be transported to, from, and within the Project, and small amounts of hazardous waste would be removed and transported off site to licensed disposal facilities. Compliance with federal, State, and local regulations would ensure that the impact would be less than significant, the same as for the Project.

Daily operations under the Housing Variant could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but it would not pose a human health risk and/or result in an adverse effect on the environment. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the City. Impacts would be less than significant, similar to the Project.

The Housing Variant site is not located within the San Francisco Airport Land Use Policy Plan Area and the Housing Variant would not result in a safety hazard from airport operations for people residing or working in the area. The site is not located within any other airport land use plan area. The Housing Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Similar to the Project, operation of the Housing Variant would not expose people or structures to a significant risk of loss, injury, or death involving fires or conflict with emergency response or evacuation plans.

Geology and Soils

As shown in Figure IV-7, the Housing Variant would remove the football stadium from the development plan and relocate 1,350 dwelling units from Candlestick Point to HPS Phase II. Both construction and operational impacts to geology and soils would be substantially similar to the Project, as discussed below, because the type of development and associated construction activities are substantially the same. Additionally, operational activities are the same as those with the Project, with the exception of the football stadium due to its removal.

Construction

As with the Project, construction activities, such as grading and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. The erosion hazard rating for the local soils in the Project site is slight to severe. Requirements to control surface soil erosion during and after construction with the Housing Variant would be implemented through the requirements of mitigation measure MM HY-1a.1 (SWPPP) and adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, would be avoided or reduced to a less-than-significant level, similar to the Project.

In addition to the potential for soil erosion, construction activities would have the potential to affect groundwater levels. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by mitigation measure MM GE-2a (dewatering), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, the Housing Variant would result in a less-than-significant impact, similar to the Project.

At the Alice Griffith Public Housing site and the Jamestown area, the removal of bedrock through heavy equipment methods or controlled rock fragmentation activities would have the potential to fracture rock adjacent to the excavation, thereby destabilizing it and possibly causing settlement of structures above it. With implementation of those techniques, ground surface and building damage monitoring, as specified in the SFBC and required by mitigation measure MM GE-3, vibration from controlled rock fragmentation in the area would not cause unacceptable settlement or damage at adjacent or nearby properties would occur. Consequently, settlement hazards related to controlled rock fragmentation would be less than significant, similar to the Project.

Operation

Impacts with respect to geology and soils conditions with the Housing Variant would be substantially similar to those of the Project.

The potential for exposure to adverse effects caused by seismic groundshaking exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would require design-level geotechnical investigations that would include site-specific seismic analyses to evaluate the peak ground

accelerations for design of Housing Variant structures and the Yosemite Slough bridge, as required by the SFBC. Implementation of these mitigation measures would ensure that potential impacts from groundshaking would be less than significant, similar to the Project.

The potential for adverse effects caused by seismically induced ground failure such as liquefaction, lateral spreading, and settlement exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, and MM GE-5a would require design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of Variant structures, as required by the SFBC through review by DBI. It is anticipated that DBI would employ a third-party engineering geologist and/or civil engineer to form a GPRC. The GPRC would complete the technical review of proposed site-specific structural designs prior to building permit approval. The structural design review would ensure that all necessary mitigation methods and techniques were incorporated in the design for Housing Variant foundations and structures to reduce potential impacts from ground failure or liquefaction a less-than-significant level, similar to the Project.

With the Housing Variant, the potential for adverse effects due to seismically induced landslides exists at the Project site. Implementation of mitigation measures MM GE-6a and MM GE-4a.2 would ensure compliance with the SFBC and any special requirements of the HUD for compliance documentation and would reduce potential impacts from landslides a less-than-significant level, similar to the Project.

With the Housing Variant, 1,350 dwelling units would replace the football stadium that is programmed for development with the Project. This specific area is not located adjacent to the shoreline such that the Housing Variant could result in impacts greater than those discussed with the Project. Therefore, the Housing Variant would result in a less-than-significant impact due to shoreline stability, similar to the Project.

The potential for adverse effects caused by landslides exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual Housing Variant elements, as specified in mitigation measure MM GE-6a. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of this mitigation, the Housing Variant's impact with regard to landslides would be less than significant, similar to the Project.

The potential for adverse effects due to settlement exists at the Project site. However, design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-5a, MM GE-4a.2, and MM GE-4a.3 would ensure compliance with the provisions of the SFBC and would reduce the impact a less-than-significant level, similar to the Project.

The potential for adverse effects caused by expansive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-10a, MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Project structures from expansive soils a less-than-significant level, similar to the Project.

With the Housing Variant, the potential for adverse effects caused by corrosive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-11a, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Housing Variant structures from corrosive soils a less-than-significant level, similar to the Project.

Fault rupture hazards are unlikely. Ground rupture occurs most commonly along preexisting faults. No known active faults cross the Hunters Point shear zone, making hazards from fault rupture unlikely with the Housing Variant.[1238] Therefore, there would be no impact caused by surface fault rupture, similar to the Project.

All development with the Housing Variant would be connected to the City's existing wastewater treatment and disposal system and would not involve the use of septic tanks or alternative wastewater disposal systems. No impact would occur, similar to the Project.

The Housing Variant would not substantially change site topography or affect unique geologic features, and would have no impact on such features, similar to the Project.

Hydrology and Water Quality

The footprint of development for the Housing Variant would be the same as for the Project, although the construction of the residential space would slightly decrease the extent of excavation for the foundation of buildings. As such, impacts from construction of the Housing Variant would be similar to the Project. With additional residential buildings replacing the stadium and associated parking lots, the total amount of development would be similar, as would the extent of impervious surfaces. Thus, operational impacts to hydrology and water quality would generally be similar to the Project.

Construction

With adherence to applicable regulatory requirements, construction activities associated with a Housing Variant would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With less excavation for building foundations, impacts would be less than and similar to the Project. With implementation of mitigation measures MM HY-1a.1 (preparation of a SWPPP for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project. Groundwater would not be used for any construction activities such as dust control or irrigation of vegetated erosion control features; no groundwater wells would be developed as part of the Project or and no on-site groundwater wells would be used for water supplies. Short-term construction groundwater dewatering may be necessary at certain locations (e.g., for installation of building foundations or underground utilities), but dewatering would have only a minor temporary effect on the groundwater surface table elevation in the immediate vicinity, and would not measurably affect groundwater supplies. The extent of impervious surfaces under the Housing Variant would be less than the Project, the Housing

[1238] GTC, 2005.

Variant would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the Housing Variant site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of the Housing Variant, the existing drainage patterns within the area would generally be preserved. Construction activities associated with the Housing Variant would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on-site or off-site. Impacts would be less than significant, similar to the Project.

Construction activities associated the Housing Variant, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of a SWPPP), impacts would be less than significant, similar to the Project.

Operation

Operation of the Housing Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, this variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As extent of impervious surfaces for the Housing Variant would be less than the Project, impacts would be similar and slightly less than the Project. Development of the Housing Variant would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of the Housing Variant could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exist at or near the site currently, or result in substantial erosion, siltation, or flooding on-site or off-site, similar to the project. Implementation of the Housing Variant would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of the Housing Variant would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of the Housing Variant would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, the Housing Variant would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

The Housing Variant would remove the football stadium from the development plan and relocate 1,350 dwelling units from Candlestick Point to HPS Phase II. Both construction and operational impacts to biological resources would be substantially similar to the Project, as discussed below, because the type of development and associated construction activities are substantially the same. Additionally, operational activities are the same as those under the Project, with the exception of the football stadium due to its removal.

Construction

Development of the Housing Variant would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, and no impact would occur, similar to the Project.

The Housing Variant would provide 96.7 of State parkland, the same amount of parkland that would be provided under the Project. However, the Housing Variant would include additional parks and would reconfigure the design and sizes of parks and open space areas at HPS Phase II compared to the Project. HPS Phase II would have 244.6 acres (13 acres more than the Project) of parks and open space. The Sports Field Complex proposed with the Housing Variant would be 65.9 acres, which is 6.2 acres more than proposed under the Project. The 3.7-acre Hunters Point South Park would be constructed in the HPS South district, which is not included in the Project. These additional open space areas would provide additional habitat for common plant and wildlife species. Impacts to common species or habitats would be less than the Project, and remain less than significant, similar to the Project.

Development of the Housing Variant could have a substantial adverse effect, either directly or through habitat modifications, on sensitive natural communities or species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur. Similar to the Project, the Housing Variant's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b would be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur. Therefore, a net increase in the quality of raptor foraging habitat would result, similar to the Project, and, with mitigation, the overall effect on raptors is expected to be beneficial. Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring.

Construction activities could impact designated critical habitat for green sturgeon and Central California Coast steelhead; however, compensatory mitigation for lost aquatic habitat as described in mitigation measures MM BI-4a.1 and MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Overall adverse effects would be less than significant, similar to the Project. Mitigation measures MM BI-4a.1, MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would reduce potentially significant impacts to Essential Fish Habitat to less-than-significant levels, similar to the Project. Ecological design features described in the Draft Parks, Open Space, and Habitat Concept Plan would result in increased habitat for western red bats, and impacts to this species would be less than significant.

Development of the Housing Variant could have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project.

Development of the Housing Variant would not conflict with the natural resource protection policies of the General Plan; however, it could result in the disturbance or loss of trees that are protected by the City's Urban Forestry Ordinance and Section 143 of the *Planning Code*. Mitigation measure MM BI-14a would ensure that development does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. With implementation of mitigation

measures MM BI-14a and MM BI-7b, the Housing Variant would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, similar to the Project, and overall impacts would be beneficial.

Operation

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to oysters, and mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to oysters. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Development of the Housing Variant could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site (eelgrass beds). Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce effects on eelgrass by surveying for and avoiding this habitat. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating species to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Implementation of the Housing Variant would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*, and with implementation of mitigation measure MM BI-14a, development would be constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of the Housing Variant would not conflict with any local policies or ordinances protecting biological resources, and there would be no impact.

Public Services

Construction

Police and Fire Services

Similar to the Project, access to the Housing Variant site during construction would be maintained by implementation of a CMTP as required in MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the area would be implemented.

Similar to the Project, construction of the Housing Variant would not result in increased demand on police protection services, as demands on the SFPD during construction would be supplemented by private security (as required by mitigation measure MM PS-1 [site security measures during construction]), and construction areas would be secured through the installation of fencing and gates.

Therefore, the Housing Variant would result in a less-than-significant impact to police protection and fire services during construction. As construction of the Housing Variant would not impact SFPD or SFFD response times upon implementation of a CMTP. These impacts would be similar to the Project.

Schools and Library Facilities

Construction of the Project would not result in impacts to the SFUSD or the San Francisco Public Library System. SFUSD or library facilities are not located on the Project site. All area school and library services would be available to the community throughout the duration of Project construction. As such, since construction of the Housing Variant would be similar to construction of the Project, no impact to school or library services during construction of the Housing Variant would occur. These impacts are the same as those identified for the Project.

Operation

Police

Operational impacts to police services would be similar to the Project in as much as they would be considered less than significant. However, the Housing Variant would result in the removal of the previously programmed football stadium, which would relieve the police department of events at which their presence would be required (approximately 12 game day and 20 other events annually). Therefore, impacts to police protection services would be less than the Project, and still less than significant.

The Housing Variant would remove the football stadium from the development program and relocate 1,350 dwelling units from the Candlestick Point site to the HPS Phase II site. As the Housing Variant would not increase the number of residential units developed, the permanent resident population would not be increased above that anticipated with the Project. Therefore, all impacts anticipated with the Project would be anticipated for the Housing Variant. However, due to the removal of the football stadium, the number of employees anticipated in the area at full build-out with the Housing Variant would be reduced by 359 thereby reducing the temporary, daytime population requiring police services. Furthermore, police presence and services would no longer be needed at the maximum twelve home game day events anticipated by the NFL for the football stadium. Patrolling this area and responding to calls would require at the least a redeployment of police services within the Bayview District, or within a wider area given the current recommendations for redistricting due to the increase in population from the underlying development program, as with the Project.

Impacts on police protection services are considered significant if an increase in population or development levels result in inadequate staffing levels (as measured by the ability of the SFPD to respond to call loads) and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. The demand for additional police personnel alone would not be considered a physical environmental impact under the provisions of CEQA.

To estimate personnel requirements for new projects, the SFPD considers the size of the incoming residential population and the expected or actual experience with calls for service from other potential uses of the site. Any potential increase in staffing at the SFPD Bayview Station would be expected to take place throughout the Housing Variant development period with the incremental addition of new housing and new non-residential building space and their occupancy.[1239]

Although the City has no adopted staffing ratio, the existing "level of service" at the SFPD can be determined by comparing citywide police force staffing[1240] to total City population (including both residents and workers). As shown in Table IV-25 (Citywide Number of Police Officers and Estimated Housing Variant [Variant 2] Demand), using a total City population for San Francisco of 1,351,469 and a police department staffing level of 2,033 in 2005, a Citywide ratio of 1 officer per 665 people was calculated.[1241] This ratio when applied to the total projected resident and employee population of the Housing Variant at build-out results in the need for an additional 52 police personnel to provide a comparable level of service, the same as the Project.

Table IV-25 Citywide Number of Police Officers and Estimated Housing Variant (Variant 2) Demand

		Population	*Police Officers*
Citywide (2005)			
Residents		799,302	
Employees		552,167	
	Total	***1,351,469***	***2,033***
Ratio (officer to population)		1:665	
Project (2032)			
Residents		24,465	
Employees		10,378	
	Total	***34,843***	***52*** [a]
Ratio (officer to population)		1:665	

SOURCE: The population and households data reported for San Francisco is 2005 data provided in a Memorandum from John Rahaim, Director of Planning, San Francisco Planning Department to Michael Carlin, Deputy General Manager, San Francisco Public Utilities Commissions, *Projections of Growth by 2030*, July 9, 2009; SFPD 2005 total staffing: PSSG District Station *Boundaries Analysis*, 2008; Proposed population and employment: Section III.C.

a. The projected number of police officers for the R&D Variant is rounded up, and most closely reflects the 1:665 ratio of the Project.

The SFPD evaluates the need for additional officers by sector, and not station or district needs. The area with the Housing Variant covers two of the five sectors within the Bayview District, both of which have been identified as high demand areas. While it is unlikely that 52 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development with the Housing Variant.

[1239] PBSJ Meeting with SFPD on April 22, 2008.
[1240] Using a Citywide police force staffing number accounts for the mixed-use nature of the Project, which would include a substantial daytime and resident or nighttime population.
[1241] City population was calculated as a 2005 population of 799,302 plus 2005 employment of 552,167; refer to Table III.C-1 (Existing Population [2005]) and Table III.C-3 (Existing Employment [2005]) of Section III.C (Population, Housing, and Employment).

Staffing increases, in and of itself, would not constitute a significant environmental impact; however, the construction of new facilities to serve the additional 52 police officers could create an environmental effect. Additional SFPD personnel needed to serve the Housing Variant would require a station from which to operate. The exact amount of space that would be needed has not yet been determined. However, using an estimate of 110 square feet per person,[1242] the additional 52 police officers would require approximately 6,000 square feet of interior building space. Additional space would be required for staff and visitor parking. According to the SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 52 of the additional police officers without the reconfiguration and expansion of the existing station or the construction of a new facility.[1243] In addition, the current surface parking lot is not adequate for existing personnel. Structured parking could be provided on the existing parking site.

Currently, the SFPD has no plans for expansion of its Bayview Station. According to the *Boundaries Analysis*, the Bayview Station is not among the priorities for replacement, expansion, improvement, or correction of current deficiencies. However, according to Public Safety Strategies Group (PSSG), there is a considerable amount of wasted or unused space at the Bayview Station that could be reconfigured to accommodate additional officers.[1244] If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 square feet (the same as the Project) could be constructed within the Housing Variant area, on land designated for community serving uses. As part of the Housing Variant, up to 100,000 gross square feet (gsf) of land divided equally between Candlestick Point and HPS Phase II would be designated for community serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses. With the construction of a new facility or a suitable retrofitting or expansion of the Bayview Station, the SFPD would have ample space to accommodate the additional police officers needed to maintain the SFPD's existing level of service. Therefore, while the development of the Project may require new or physically altered police facilities in order to maintain acceptable police services, the potential impacts associated with the construction of a new facility have been addressed in this EIR and would not require further environmental review. Therefore, the anticipated development would not require new or physically altered police facilities beyond the scope of the Housing Variant in order to maintain acceptable police protection services and therefore, operational impacts to police protection services would be less than significant, similar to the Project.

Fire Protection Services

Operational impacts to fire protection and emergency medical services would be similar to the Project in as much as they would be considered less than significant. The Housing Variant would remove the football stadium from the development plan and would relocate 1,350 housing units from Candlestick Point to HPS Phase II. This would result in the potential for lower buildings, both at Candlestick Point and HPS Phase II, which could reduce potential impacts to fire services. Additionally, the Housing Variant would result in a smaller, daytime population because the number of employees at the site would be reduced by 359 as a result of removal of the football stadium development. Additional fire protection resources that

[1242] The Bayview Station is approximately 16,000 gsf, and the capacity is about 140 officers, resulting in about 114 sf per officer.
[1243] Personal communication, John Loftus, Captain, Bayview District Station to Allison Wax, PBS&J, August 31, 2009.
[1244] PBSJ Meeting with SFPD on April 22, 2008.

would be required to patrol the football stadium on game days with the Project would not be required with the Housing Variant, thereby reducing that potential impact. Therefore, impacts to fire would be similar to the Project.

The number of housing units would not be increased with the Housing Variant, and the permanent resident population would not be increased above that anticipated with the Project. Buildings on the HPS Phase II site would be 40 to 65 feet high, similar to proposed adjacent development. This would be lower than the 156-foot maximum height anticipated with the football stadium. On the Candlestick Point site, the majority of buildings would remain 65 feet. However, the number and location of towers would be reduced. The reduction in building height would reduce potential impacts to fire protection services.

Building Safety

Similar to the Project all new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help to minimize the demand for future fire protection services. The Housing Variant development plan differs from the Project in that the football stadium programmed for the Project would be removed and 1,350 dwelling units would be relocated from Candlestick Point to HPS Phase II. These uses would be provided primarily in buildings that would have a maximum allowable height ranging between 40 feet and 65 feet at both Candlestick Point and HPS Phase II, as shown on Figure IV-8. At Candlestick Point, the number and location of towers would be reduced. Plan review for all structures for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services. In addition, development of the Housing Variant would include expansion of the AWSS to provide water infrastructure for firefighting activities. Therefore, the Housing Variant would result in a less than significant operational impact to fire services due to building safety.

Response Time

As discussed with the Project, existing SFFD facilities in the Bayview neighborhood would provide adequate response times to most points within Candlestick Point and no new or physically altered fire or emergency medical facilities would be required in order to maintain an acceptable level of service. However, portions of the proposed development at HPS Phase II would be at a distance from existing fire stations including those most proximate to the site (Stations 44 and 17), which could result in the SFFD taking anywhere from 8 minutes to 14 minutes to access the HPS Phase II site in the event of an emergency. The SFFD strives to maintain a Code 3 emergency response time of 4.5 minutes, which may not be accommodated due to the distance of the nearest station from the HPS Phase II site. As such, a new fire station located in closer proximity to the HPS Phase II site would be needed to ensure adequate response times for HPS Phase II. The SFFD does not consider response time to the furthest point of the HPS Phase II site to be acceptable, given the density of proposed development and the distance from the nearest fire station.[1245] However, the Housing Variant would decrease the daytime population in this area by 359 people, which would reduce the potential impact to the existing SFFD resources. SFFD staff concluded that a fire station would be needed at a site that would offer more rapid response to the HPS Phase II site. Initial SFFD recommendations for such a station included providing one engine (four staff), one truck

[1245] PBSJ Meeting with San Francisco Fire Department on July 8, 2008.

(five staff), and one ambulance (staff requirements not indicated). Both Station 9 and Station 17 include one engine and one truck, and their approximate building size is 6,100 gsf and 6,000 gsf, respectively. Neither station includes an ambulance. A new approximately 6,000-gsf SFFD station could be accommodated within the Housing Variant site, on land designated for community serving uses. As part of the Housing Variant, up to 100,000 gsf of land divided equally between Candlestick Point and HPS Phase II would be designated for community serving uses, such as fire, police, healthcare, day-care, places of worship, senior centers, library, recreation center, community center, and/or performance center uses. The Applicant has designated a total of 5.3acres of community-serving uses in HPS Phase II, including 0.5 acre of which have been designated for a new SFFD facility.

These uses have been anticipated as part of the Housing Variant and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[1246] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. Therefore, the anticipated development would not require new or physically altered fire facilities in order to maintain acceptable fire protection services and operational impacts to fire protection services would be less than significant, similar to but potentially less than the Project.

Schools

Operational impacts to schools would be similar to the Project because the number of dwelling units anticipated would be the same. Therefore, the number of school aged children that would require adequate school services would be approximately similar to the Project. Impacts from the Housing Variant on schools would be less than significant, similar to the Project.

Library Facilities

Operational impacts to libraries would be similar to the Project because the same number of dwelling units anticipated would be the same. Additionally, the Housing Variant would result in 359 less employees due to the loss of the football stadium. Therefore, the service population for the existing library facilities would be the same, if not less, than the Project. Similar to the Project, library branches that currently serve the area including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under

[1246] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Therefore, the Housing Variant would result in a less than significant operational impact to library services, similar to the Project.

Recreation

The Housing Variant would include the construction and improvement of new parks, recreational facilities, and open space. At buildout of this Variant, approximately 349.4 acres of parks, open space, and recreational uses would be provided, as described in Table IV-21, which is about 13 acres more than proposed with the Project. The Sports Field Complex with the Housing Variant would be 94.7 acres, about 3.1 acres more than the Sports Field Complex proposed with the Project, and a total of 158 acres of parkland would be provided, about 9.9 acres more than proposed with the Project.

Construction impacts related to recreational facilities would be the substantially the same as those identified with the Project because the construction activities would be substantially similar, with the Housing Variant requiring slightly more construction due to the provision of about 13 acres more of parkland.

The Housing Variant would have the same number of housing units as proposed with the Project, thereby resulting in the same residential population of 24,465, although 13 acres more of parkland would be provided. Operational impacts are determined based on a ratio of acres of parkland per resident. Currently, the City provides approximately 7.1 acres of parkland per thousand residents, and the standard used in Section III.P assumes a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet the demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. The parkland-to-population ratio associated with the Housing Variant would be 14.2, which is 0.5 more than with the Project. The Housing Variant ratio would be considerably higher than the ratio of 5.5 acres of parkland per thousand residents, which is considered sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. Impacts would be less than significant.

Park Phasing

The timing of Housing Variant development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities.

The conceptual development plan for this Variant would result in the development of residential units and parks during all of four stages of development. Table IV-26 (Housing Variant Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the Housing Variant). As this table indicates, the park-to-population ratio would not drop below 14.3 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population. Table IV-26 demonstrates that adequate parkland would be provided during each stage of development. However, during a given phase, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is

conceptual and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed, and a less-than-significant impact would result.

Table IV-26 Housing Variant Residential Units and Park Acreage Provided during Each Stage of Development

Stage of Development	*Residential Units*	*Population*	*Total Parkland (ac)*	*Park-to-Population Ratio (acres per 1,000 Residents)*
Existing	256	1,113[a]	120.2	108
Phase 1	3,005	7,002[b]	137.1	19.6
Phase 2	7,185	16,741[b]	275.6	16.5
Phase 3	9,400	21,902[b]	348.6	15.9
Phase 4	10,500	24,465[b]	349.4	14.3

a. Refer to Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Employment, and Housing). This population correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.
b. Calculated as 2.33 people per residential unit.

Senate Bill 792 (SB 792) (refer to Appendix P2) was signed by the Governor on October 11, 2009, and is codified as Chapter 203 of the Statutes of 2009. SB 792 repeals the *Hunters Point Shipyard Conversion Act of 2002,* the *Hunters Point Shipyard Public Trust Exchange Act,* and *Public Resources Code* Section 5006.8, and consolidates the key provisions of those statutes into a statute covering both the Candlestick Point area and HPS. The statute authorizes a reconfiguration of CPSRA coupled with improvements within the park and the provision of an ongoing source of park operation and maintenance funding. The proposed reconfiguration would remove about 29.2 acres from the current boundaries of CPSRA to be used for urban development, but would add about 5.7 acres not currently included in the CPSRA to The Neck, The Heart of the Park, and The Last Port areas of the CPSRA. These additional acres would widen the park at in an area where the CPSRA boundary currently runs very close to the shoreline, creating a very narrow "pinch point" in the park. The additional acreage would thus create a buffer between development and the shoreline and improve the recreational value of this section of the park. In total, the area of the CPSRA (excluding the Yosemite Slough) would decrease by about 23.5 acres at the Candlestick Point site, from 120.2 acres to 96.7 acres, which is the same as the Project.

While the reconfiguration of CPSRA would remove a net of 29.2 acres from the park, all of that acreage is degraded or unimproved (and not maintained) and does not provide substantial recreation opportunities to the community. Most of the land that would be removed from CPSRA is either currently used for stadium parking or is directly adjacent to Harney Way. The reconfiguration would add 5.7 acres of new parkland in The Last Port, The Neck, and The Heart of the Park, all areas that are currently developed and actively used that have high value as recreational resources. This additional acreage would widen the park at this important point, increasing its capacity for new users. Although there would be a net decrease in the total area of the CPSRA, that portion of the CPSRA that is currently developed and used for recreational purposes would be further expanded (by 5.7 acres) and improved.

Moreover, the Housing Variant would provide substantial improvements throughout the CPSRA. These improvements, which are described at length in the discussion of Impact RE-2, include revegetation and landscaping, shoreline restoration and stabilization, infrastructure improvements (such as trails, pathways, and visitor facilities), the provision of habitat and opportunities for environmental education, "Eco-Gardens," and salt-marsh restoration. Figure III.P-8 shows the existing unimproved and improved areas of the CPSRA and indicates where land would be removed or added relative to the existing CPSRA uses. These improvements would turn portions of the Park that are used for Candlestick Park stadium parking or are undeveloped and underutilized into vibrant parts of the CPSRA and of the overall network of parks. Currently improved parts of the CPSRA, such as The Heart of the Park, The Point, The Neck, and The Last Port, would also be improved. Overall, the reconfiguration and improvements would enhance park aesthetics and landscape ecology; provide connections throughout the CPSRA and the other parks; and provide direct access to the Bay and the Bay shoreline for walking, swimming, fishing, kayaking, and windsurfing. The Variant's proposed reconfiguration of the CPSRA, therefore, would not adversely affect the park's existing recreational facilities and opportunities.

The improvement and development of the CPSRA is expected to increase usage of CPSRA by visitors. While the number of additional visitors cannot be accurately predicted at this time, the Project's improvement will increase the amount of land at CPSRA that provides recreational opportunities (as discussed above), and will thus enable the park to accommodate the new demand. Moreover, the agreement between CDPR and the City or the Agency, providing for the reconfiguration of CPSRA, would also provide at least $10 million in funding for operation and maintenance of the park, further enabling the park to accommodate increased demand.

A Technical Memorandum was prepared to study wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes development at the Project site (even if under the Housing Variant), generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). The Variant would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

In summary, impacts resulting from the Housing Variant would be substantially similar to the Project.

Utilities

Water

The operational activities of the Housing Variant would be similar to those of the Project, inasmuch as there would be temporary, daytime populations at the Housing Variant site and full-time residential populations that generate retail water demand from SFPUC.

With the Housing Variant, the football stadium proposed with the Project for the HPS Phase II site would be removed and 1,350 housing units would be relocated from the Candlestick Point site to the HPS Phase II site. The Housing Variant would not generate additional permanent residents over that of the Project. Additionally, the Housing Variant would result in the loss of 359 jobs due to removal of the football stadium. This would decrease the potential water consumption from the site. As shown in Table IV-27 (Housing Variant Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance [mgd]), the Housing Variant would consume approximately 1.66 mgd of water. With existing water use at the CP-HPS Phase II site of 0.3 mgd, the net change in water demand with the Housing Variant would be an increase of 1.36 mgd, a decrease of 0.01 mgd compared to Project.

Table IV-27 Housing Variant Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance (mgd)

Land Use	*Candlestick Point*	*Hunters Bay Shipyard*	*Total*
Residential	0.51	0.33	0.83[a]
Hotel	0.05	0.00	0.05
Office	0.04	0.02	0.04
Artists Studios	0.00	0.01	0.01
R&D	0.00	0.36	0.36
Neighborhood Retail	0.02	0.02	0.03[a]
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.00	0.00
Performance Venue	0.01	0.00	0.01
Subtotal	*0.71[a]*	*0.73[a]*	*1.45[a]*
Parks and Open Space	0.06	0.15	0.22
Total Demand	***0.77[a]***	***0.88[a]***	***1.66***

SOURCE: Arup, Candlestick Point–Hunters Point Shipyard Phase II Water Demand Memorandum, October 15, 2009.

a. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals used in this table. These entries are correct and are consistent with Table 13 of the Water Demand Memorandum.

As with the Project, sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System, and thereby meet retail demand for water treatment, including the net increase of 1.36 mgd for the Housing Variant. As the current and planned treatment capacity of existing RWS water treatment facilities is sufficient to serve the Housing Variant, implementation of this variant would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant, similar to the Project.

As with the Project, beginning in 2025, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with the Housing Variant. With the implementation of the WSAP and RWSAP during multiple dry-year periods, which could include voluntary rationing or other water conservation strategies, existing and projected future water supplies could accommodate estimated future water demand, including the Project-related demand. As discussed

in the WSA, the SFPUC has approved and has made substantial progress towards the implementation of the water facility improvement projects identified in the WSIP. The SFPUC has received voter approval to fund the Phased WSIP program and has initiated bond sales to fund implementation of individual projects, which are in various stages of implementation, including subsequent environmental review, design, or construction.[1247] Thus, there is substantial evidence that the SFPUC would implement the Phased WSIP facility projects described above, including the local water supply projects.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects, and various conservation efforts. The proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco.[1248,1249] Recycled water will primarily be used for landscape irrigation, toilet flushing, and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project is expected to begin environmental review in late 2009 or early 2010. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project. The local water supply improvement projects were approved as part of the Phased WSIP and are included in the WSIP funding program. The SFPUC has initiated planning, environmental review, and design of several recycled water and groundwater projects and conservation programs are in place. Thus, there is substantial evidence that the additional water provided by those projects would be available to supplement retail water supplies.

As noted above, the SFPUC adopted the Phased WSIP, which phased implementation of the water supply program to provide an additional 20 mgd of supply to meet projected demand through 2018 and requires the SFPUC to re-evaluate water demands and water supply options by December 31, 2018 through 2030 to meet projected demand. The Housing Variant would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, and this impact is less than significant, similar to the Project.

Wastewater

The construction impacts of the Housing Variant would be substantially similar to the Project because the types of land uses and construction activities required with both would be similar.

The operational activities of the Housing Variant would be similar in nature to those of the Project as the land uses and quantities of these land uses would be approximately similar. The Housing Variant would replace existing wastewater conveyance infrastructure within the site to adequately serve the Housing Variant.

With the Housing Variant, the football stadium proposed with the Project for the HPS Phase II site would be removed and 1,350 housing units would be relocated from the Candlestick Point site to the HPS

[1247] Per the *Water System Improvement Program Quarterly Report, Q4, FY 2008/2009* (dated August 20, 2009), (prepared by the SFPUC), as of July 1, 2009, two (2) projects are in the Planning Phase, eleven (11) projects are in the Design Phase, six (6) projects are in the Bid and Award Phase, five (5) projects are in the Construction Phase, two (2) projects in the Close-Out Phase, eight (8) projects are completed, one (1) project has not been initiated, and eleven (11) projects have multiple active phases. Available at: http://sfwater.org/Files/Reports/01_RW_Program_Summary.pdf Accessed September 28, 2009.

[1248] San Francisco Planning Department, Final Program Environmental Impact Report, Water Supply Improvement Program, October, 2008.

[1249] SFPUC, Urban Water Management Plan, 2005.

Phase II site. The Housing Variant would not generate additional permanent residents over that of the Project. Additionally, the Housing Variant would result in the loss of 359 jobs due to removal of the football stadium. This would decrease the potential wastewater generation from the site. As shown in Table IV-28 (Housing Variant Wastewater Generation), the Housing Variant would result in the generation of 1.16 mgd of wastewater, a decrease of 0.02 mgd of wastewater from the Project.

Table IV-28 Housing Variant Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as % of Water Demand (or as otherwise specified)*	*Candlestick Point (mgd)*	*Hunters Point (mgd)*	*Total Housing Variant (mgd)*
Residential	95%	0.48	0.31	0.79
Regional Retail	57%	0.05	0	0.05
Neighborhood Retail	57%	0.01	0.01	0.02
Office	57%	0.02	0.01	0.03
Community Uses	57%	0.01	0.01	0.02
Research and Development	57%	0	0.21	0.21
Hotel	57%	0.03	0	0.03
Football Stadium	95%	0	0	0
Performance Venue	95%	0.01	0	0.01
Total		***0.61***	***0.55***	***1.16***

SOURCE: Arup, October 15, 2009.

The 1.16 mgd of wastewater projected for operation of the Housing Variant would be transported via new or expanded conveyance systems within the Housing Variant site and existing mains to the SWPCP.[1250] The existing wastewater/stormwater conveyance lines between the HPS Phase II site and the SWPCP are sized to accommodate both dry- and wet-weather flows. Wastewater from the Housing Variant would flow into the Hunters Point Tunnel (from the HPS Phase II site) and the Candlestick and Hunters Point tunnel sewer (from the Candlestick Point site). The Hunters Point tunnel sewer has an average dry-weather flow of 6 mgd (4,167 gpm) and a design capacity of 120 mgd (83,333 gpm) (refer to Table IV-29 [Sewer Trunk Capacity and Housing Variant Maximum Peak Flows]).[1251] Peak dry-weather flow capacities can be calculated by multiplying the average gallons-per-minute flow by a peaking factor. For purposes of this analysis, a conservative peaking factor of 3.0 was used, which yields a maximum flow capacity of 12,501 gpm for the Hunters Point tunnel sewer. Projected maximum peak flows from the HPS Phase II development with the Housing Variant, based on a peaking factor of 3.0, would be 1,146 gpm[1252]. The remaining capacity of the Hunters Point tunnel sewer is 83,333 gpm. Therefore, the addition of 1,146 gpm peak flow from the HPS Phase II development with the Housing Variant would be accommodated within the remaining capacity of the Hunters Point tunnel sewer (83,333 gpm).

[1250] *Candlestick Point/ Hunters Point Shipyard Infrastructure Concept Report* (October 26, 2009) prepared by Winzler & Kelly Consulting Engineers.
[1251] San Francisco Public Utilities Commission, Bayside Operations Plan, 2002.
[1252] Calculated as 0.55 MGD/24 hours/60 minutes * 3.0*1,000,000.

Table IV-29 Sewer Trunk Capacity and Housing Variant Maximum Peak Flows

Sewer Trunk	*Design Capacity (gpm)*	*Existing Average Dry-Weather Flow[a] (gpm)*	*Existing Maximum Peak Dry-Weather Flow[b] (gpm)*	*Variant Contribution—Maximum Peak Dry-Weather Flow[c] (gpm)*	*Remaining Peak Flow Capacity (gpm) With Housing Variant*
Candlestick tunnel sewer	34,722	1,736	5,208	1,270	28,244[e]
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	1,145	69,687[f]

SOURCE: Bayside Operations Plan, 2002.

a. Calculated as existing average dry-weather flow in mgd/24 hours/60 minutes 1,000,000.
b. Calculated as existing average flow in gpm x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in mgd/24 hours/60 minutes X 1,000,000 X peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses at Candlestick Point (including Alice Griffith Public Housing, the RV park, and the stadium) that will be demolished on site and that currently contribute to the Candlestick tunnel sewer. Therefore, the actual remaining peak flow capacity of the Candlestick tunnel sewer with the Project will be somewhat greater than 28,035 gpm.
f. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses on the HPS Phase II site that will be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with the Project will be somewhat greater than 69,853 gpm.

The Candlestick Point development would discharge a maximum peak flow of 1,271 gpm of wastewater into the off-site Combined Sewer System.[1253] During wet-weather conditions, the off-site Combined Sewer System would accommodate both wastewater and stormwater flows, as it does currently. The Combined Sewer System is designed to accommodate wet-weather flows, and the Candlestick tunnel sewer has a maximum flow capacity of 34,722 gpm and the Hunters Point tunnel sewer (into which discharges in the Candlestick tunnel sewer flow) has a maximum flow capacity of 83,333 gpm. The contribution of 1,271 gpm maximum peak flow from Candlestick Point represents only 3.7 percent of the total design capacity of the Candlestick tunnel sewer. Therefore, the Housing Variant would result in a less-than-significant impact to wastewater conveyance, similar to the Project.

Because the existing conveyance infrastructure could accommodate the additional flows from the Housing Variant development in addition to existing flows even during periods of peak flows, no expansion of the off-site wastewater conveyance lines would be required as a result of the Housing Variant development, similar to the Project.

The contribution of the Housing Variant to the Bayside system represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development of the Housing Variant would increase wastewater flows (as intermittent flows from Candlestick Park stadium would be replaced by year-round flows from mixed-use development), the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System.

The land use program and associated stormwater flows from the Candlestick Point site would be the same with the Housing Variant as with the Project. Therefore, treatment of stormwater would also be the same as with the Project. Stormwater from the HPS Phase II site is collected and discharged to the Bay via a separate stormwater system, which does not contribute any flows to the Combined Sewer System during

[1253] Calculated as 0.61 MGD/24 hours/60 minutes * 3.0*1,000,000.

wet weather. With the Housing Variant, stormwater would continue to be collected and treated in a separate stormwater system, and no stormwater runoff would be contributed to the Combined Sewer System during wet weather. Although development with the Housing Variant at the HPS Phase II site would result in a net increase in wastewater flows, the additional flows would represent less than 0.1 percent of the remaining treatment capacity of the SWPCP.

The increase in wastewater generation with the Housing Variant would incrementally contribute to the total amount of wet-weather flows that are collected and treated at the SWPCP, the North Point Wet Weather Facilities (NPWWF), and the Bayside Wet Weather Facilities. When the combined storage and treatment capacity of those facilities are exceeded, wastewater from the Housing Variant development could be discharged, along with other wet-weather flows from the combined system, via the CSOs located around the perimeter of San Francisco. Mitigation measure MM UT-3a would ensure that there would be no net increase in wet-weather flows in the Combined Sewer System as a result of the Project that could result in a temporary increase in CSO volume. During wet weather, the temporary retention or detention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project would ensure that there would be no increase in the likelihood of a CSO event as a result of the Project. The impact would be less than significant, similar to the Project.

The land use program and associated stormwater flows from the Housing Variant site would be the same with the Housing Variant as with the Project and would not increase, further being reduced by the removal of the football stadium. Therefore, treatment of this stormwater would also be the same as with the Project. Stormwater from the HPS Phase II site is collected and discharged to the Bay via a separate stormwater system, which does not contribute any flows to the Combined Sewer System during wet weather. With the Housing Variant, stormwater would continue to be collected and treated in a separate stormwater system, and no stormwater runoff would be contributed to the Combined Sewer System during wet weather. Although development with the Housing Variant at the HPS Phase II site would result in a net increase in wastewater flows of 0.55 mgd, the additional flows would represent less than 0.1 percent of the remaining treatment capacity of the SWPCP. Stormwater from Candlestick Point would be reduced when compared to the Project and would be taken by the Combined Sewer System. This would not change with the Housing Variant.

The NPDES permit system requires that all existing and future municipal and industrial discharges to surface waters within the City be subject to specific discharge requirements. Wastewater from the Housing Variant would be treated at the SWPCP wastewater treatment plant and the SFPUC, who operates the SWPCP wastewater treatment plant, is required to comply with waste discharge requirements (WDRs) set by the RWQCB, which specify the allowable levels of pollutants in discharges from the facility. Compliance with any applicable WDRs, as monitored and enforced by the SFPUC, would ensure that the Housing Variant does not exceed the applicable wastewater treatment requirements of the RWQCB, and this impact would be less than significant, similar to the Project.

Solid Waste

Construction wastes with the Housing Variant, including demolition and hazardous wastes, would be similar to that generated with the Project because the materials used for construction would be substantially similar for both. Construction waste would be sorted, prior to disposal, to ensure that all recyclable

materials are salvaged from the waste stream that is ultimately taken to a landfill. Incorporation of mitigation measure MM UT-5a (Construction Waste Diversion Plan) would ensure that impacts to solid waste during construction are reduced to a less-than-significant level.

Operation

Operational impacts of the Housing Variant would be substantially similar to the Project because the amount and type of solid waste generated would be similar based on similar land uses, recycling activities would be implemented with both projects, and neither project would result in the exceedance of current landfill capacities. With the Housing Variant, the football stadium proposed for the HPS Phase II site would be removed and 1,350 dwelling units would be relocated from the Candlestick Point site to the HPS Phase II site. As shown in Table IV-30 (Housing Variant Solid Waste Generation), the Housing Variant would result in 7,512 tons of waste at full build-out of the HPS Phase II site and 12,222 tons of solid waste at full build-out of the Candlestick Point site, for a total of 19,734 tons of waste annually. This is a decrease of 768 tons of waste annually due to removal of the football stadium. This total waste stream would constitute 3.1 percent of the City's total waste stream.[1254] The increase in solid waste generation associated with the Housing Variant development would not be substantial in the context of citywide solid waste infrastructure demand.

Landfill capacity is a dynamic metric dependent on the amount of solid waste that requires disposal (and the effectiveness of source reduction and recycling methods), the permitted capacity of the landfills, and the number of landfills that can accommodate solid waste. The City has a contract with Altamont Landfill to accept the City's waste through 2014. In 1988, the City of San Francisco entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste. Through August 1, 2009, the City has used 12,579,318 tons of this capacity. The City projects that the remaining capacity would be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[1255]

The City has issued a Request for Qualifications to solicit bids for a new contract to accommodate the City's disposal capacity beyond the expiry of the current agreement. The City has selected three landfills that have the capacity to meet the City's future needs and is in the final stages of the selection process that will result in an agreement for ratification by the Board of Supervisors no later than early 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs.

[1254] California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Accessed online at: <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco>, Accessed: November 5, 2008. 627,157 total tons of solid waste in 2007.

[1255] E-mail communication with David Assman, City of San Francisco, Department of the Environment, October 19, 2009.

Table IV-30 Housing Variant Solid Waste Generation

Use	Generation Factor (per day)	Candlestick Point			HPS Phase II			Total		
		Area or Units	Tons per Day or Event	Tons per Year	Area or Units	Tons per Day or Event	Tons per Year	Area or Units	Tons per Day or Event	Tons per Year or per Total Number of Events[a]
Residential	5.653 lbs/unit	6,500 units	18.4	6,716	4,000 units	11.3	4,124.5	10,500 sf	29.7	10,840.5
Retail	0.02600411 lbs/sf	760,000 sf	9.9	3,613.5	125,000 sf	1.6	584.0	885,000 sf	11.5	4,197.5
Office	0.006 lbs/sf	150,000 sf	0.5	182.5	0	0	0	150,000 sf	0.5	182.5
Hotel	0.0108 lbs/sf	150,000 sf	0.8	292.0	0	0	0	150,000 sf	0.8	292.0
R&D	0.006 lbs/sf	0	0	0	2,500,000 sf	7.5	2,737.5	2,500,000 sf	7.5	2,737.5
Performance Venue	2.23 lbs/seat	10,000 seats	5.6[b]	836.3[c]	0	0	0	10,000 seats	5.6	836.3[c]
Stadium	2.23 lbs/seat	0	0	0	0	0	0	0	0	0
Art Center	0.006 lbs/sf	0	0	0	255,000 sf	0.8	292	255,000 sf	0.8	292.0
Community Facilities	0.006 lbs/sf	50,000 sf	0.15	54.8	50,000 sf	0.15	54.8	100,000 sf	0.3	109.6
Total				***11,695.1***			***7,792.8***			***19,487.9***

SOURCE: PBS&J 2009; Generation Factors from Arup, *Carbon Footprint Report*, March 24, 2009.

a. Calculated by adding the horizontal columns, rather than calculating total number of units by the generation rate.
b. The Performance venue is projected to be 50 percent attendance.
c. Assumes 150 events per year at 50 percent attendance. Attendance estimate is based on CABER, Towson University & Sage Policy Group, Inc., *The Economic Feasibility of a Montgomery County, MD Arena*, June 2007.
d. Assumes a sold-out event with a 5 percent "no-show" rate.
e. Assumes 12 sold-out games and 20 other sold-out stadium events per year.

- As noted, at current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1256] Demolition activities, which generate construction debris, are expected to conclude in 2028 at Candlestick Point and in 2023 at HPS Phase II, one year before the landfill is expected to close. Further, the City requires the diversion of at least 75 percent of construction waste, as also required by MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Housing Variant on solid waste would be further reduced. The impact of the construction waste generated by the Housing Variant on the capacity of the Altamont Landfill would be less than significant.

Typical municipal solid waste has a landfill density of 739 pounds per cubic yard.[1257] Using this density factor, 45.7 million cubic yards of remaining capacity at the Altamont Landfill would be equivalent to 33.7 million tons of remaining capacity. The contribution of 19,488 tons annually of solid waste with the Housing Variant development would represent only 0.02 percent of the remaining capacity of the identified landfills. Additionally, approximately 72 percent of the City's total waste stream, by volume, was diverted in 2008.[1258] Of the wastes that were not diverted, the City estimates that up to 65 percent of the total volume consists of readily recyclable or compostable materials, such as paper and food scraps.[1259] The remainder of the wastes consists of materials such as disposed household items and furniture, hazardous wastes, and construction wastes. The City has prepared a number of strategies to divert additional solid waste and achieve citywide diversion goals. These strategies would be utilized to achieve the City's overall waste reductions goals. The City's contribution to landfills is anticipated to diminish over time as the City implements more aggressive waste diversion strategies. Increasing solid waste diversions would extend the life of the landfills utilized by the City, lengthening the time horizon before the remaining disposal capacity is filled.

All residents and businesses with the Housing Variant would be expected to comply with the City's waste and recycling ordinances. On the basis of the landfill capacity and diversion strategies noted above, and with implementation of the comprehensive waste diversion strategies, as well as implementation of mitigation measure MM UT-71 (Site Waste Management Plan), the Housing Variant would result in a less-than-significant impact to solid waste, similar to the Project.

Electricity, Natural Gas, and Telecommunications

The proposed improvements within the Project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. The power supplier may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into the Project site. This could include a new substation within the project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and

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[1256] CIWMB, 2009.
[1257] http://wasteage.com/mag/waste_municipal_solid_waste/ (accessed September 29, 2009).
[1258] This figure is a preliminary estimate and represents the most recent data available. California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco (accessed: November 5, 2008).
[1259] San Francisco, *Waste Characterization Study: Final Report.* 2008.

Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the Housing Variant, similar to the Project. Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR. The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for the Housing Variant, similar to the Project.

Energy

Construction

Construction activities of the Housing Variant would be similar to the Project as the construction equipment usage, types of energy resources needed, type of construction activities, and construction timeline would be similar.

The construction activities proposed with the Housing Variant do not include unusual or atypical activities that would result in a higher than average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy. Thus, construction activities would not be large in comparison to a project of a similar size and with similar land uses, and the Housing Variant would result in a less-than-significant impact, similar to the Project.

Operation

Electricity

The operational impacts of the Housing Variant would be similar to the Project because the types of energy required and the proposed uses would be similar to that considered with the program for the Project. However, the Housing Variant would result in the demand for less electricity than the Project; therefore, impacts would be less (about 12 percent less). As discussed in Section III.R, the operational impacts of a project are considered significant if it encourages activities that result in the use of large amounts of energy or uses such resources in a wasteful manner. The criterion for this impact considers whether the Housing Variant would result in a large increase in electricity consumption. As shown below in Table IV-31 (Housing Variant Electricity Demand from Building Envelopes [MWh]), the Housing Variant would be expected to result in an electricity demand of approximately 30,895 Megawatt hours (MWh). While about 12 percent less than the Project, this would not be a large overall increase in consumption over the existing conditions of 9,990 MWh; however, two uses (residential and R&D) would account for 86 percent of the increase in demand for electricity at the site. R&D uses would be the largest source of electricity consumption at HPS Phase II, while residential units would be the largest source of electricity consumption

Table IV-31 Housing Variant Electricity Demand from Building Envelopes (MWh)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Electricity Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)[a]*	*Development Program[b]*	*MWh Consumed Annually, 2008 Title 24 Standards[c]*	*MWh Consumed Annually, with 15% Reduction*	*Development Program[b]*	*MWh Consumed Annually, Title 24 Standards[c]*	*MWh Consumed Annually, with 15% Reduction*	*Development Program*	*MWh Consumed Annually, Title 24 Standards*	*MWh Consumed Annually, with 15% Reduction*	*Percent of Total Electricity by Land Use*
Residential Units	1.7350[d]	7,850	13,620	11,577	2,650	4,598	3,908	10,500	18,218	15,485	50%
Retail	0.0027	635,000	1,715	1,457	—	0	0	635,000	1,715	1,457	8%
Neighborhood Retail	0.0027	125,000	338	287	125,000	338	287	250,000	675	574	2%
Office	0.0052	150,000	780	663	—	0	0	150,000	780	663	2%
R&D	0.0052	—	0	0	2,500,000	13,000	11,050	2,500,000	13,000	11,050	36%
Hotel	0.0027	220	1	1	—	0	0	220	1	1	0%
Artist Studios/ Center	0.0052	—	0	0	255,000	1,326	1,127	255,000	1,326	1,127	4%
Community Space	0.0052	50,000	260	221	50,000	260	221	100,000	520	442	1%
Arena	0.0015	75,000	113	96	—	0	0	75,000	113	96	0%
Total			***16,825***	***14,301***		***19,522***	***16,593***		***36,348***	***30,895***	***100%***

SOURCES:

Housing Variant electricity demand was estimated based on the Applicant's commitment to achieve 15 percent energy reductions below Title 24 standards and use ENERGY STAR appliances in all residential units.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, July 2009, Table 3-8. The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15 percent Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. Based on buildout floor areas provided in Table IV-19 of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The electricity factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16. The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

e. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

at Candlestick Point. Because R&D uses result in heavy electricity consumption during peak daytime hours (largely due to HVAC, lighting, and the operation of office equipment), the Housing Variant could generate high levels of peak demand, similar to the Project.[1260]

Taking the Housing Variant's compliance with the Green Building Ordinance and its voluntary implementation of energy-saving design features into consideration, as well as the level of development proposed, the electricity increase associated with the Housing Variant would not be considered large.

The City's threshold also considers whether the Housing Variant's energy consumption would be wasteful. The efficiency measures proposed under the Housing Variant would result in building envelope consumption of at least 15 percent less electricity than a project that would not implement such measures. Further electricity savings would be anticipated as a result of the Housing Variant's compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and the Housing Variant's voluntary implementation of LEED® for Neighborhood Development (LEED® ND) standards based on the Pilot Version of the rating system released in June 2007.[1261] However, because the Housing Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Housing Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts to less than significant.

The City's significance criterion also considers whether a project's energy consumption would be wasteful. The efficiency measures proposed with the Housing Variant would result in less electricity consumption than a project that would not implement such measures. These measures include installation of ENERGY STAR appliances, a measure aimed at reducing residential electricity consumption, which as discussed in the preceding paragraph, is a land use with correspondingly high energy consumption. Therefore, the Housing Variant has demonstrated a good faith effort to avoid wasteful consumption of energy for residential uses. In addition, as discussed in the preceding paragraph, the Housing Variant Applicant would be required to comply with the City's Green Building Ordinance and has committed to pursuing LEED® ND credits.[1262] Thus, electricity consumption with the Housing Variant development would be considered efficient and not wasteful. Operational electricity impacts would be less than significant, similar to the Project.

[1260] Although the Housing Variant would include on-site electricity infrastructure, local delivery infrastructure is supplied by larger transmission lines, substations, and generation facilities owned by PG&E and other entities. Adding new connections to the overall power grid, thereby increasing demand on the grid, contributes to the need for periodic infrastructure upgrades. More importantly, because electricity cannot be stored once it is generated, the need for development of additional electricity generation sources is largely dependent on the peak level of conveyance. Designing electricity infrastructure is similar to designing highways, which are sized to convey rush-hour demand.

[1261] Since the initial release of the ND standard, the rating system has undergone two public comment periods, and several credit requirements have changed. The LEED® ND rating system is currently being finalized for formal release by the USGBC.

[1262] Savings associated with these features cannot be calculated until the designs of individual buildings have been completed.

Natural Gas

The operational impacts of the Housing Variant would be similar to the Project as the types of energy required and the proposed uses would be similar to that considered with the program for the Project. However, the Housing Variant would result in the demand for 11 percent less than the natural gas demand of the Project.

Table IV-32 (Housing Variant Natural Gas Demand, Baseline [MBtu]) presents the annual natural gas use for the Housing Variant, estimate based on land use and minimal compliance with Title 24 standards as well as the Housing Variant Applicant's preliminary commitment to reduce energy use to 15 percent below Title 24 standards. The natural gas demand associated with the Housing Variant would be approximately 56,063 MBtu, in comparison to a similarly sized project that would not include the 15 percent reduction below 2008 Title 24 standards and which would result in consumption of approximately 66,670 MBtu of natural gas use annually. However, this is approximately 7,200 MBtu less than the Project.

The natural gas use at the Project site would represent less than 1 percent of the City's overall natural gas consumption of 28,918,000 million Btus, and overall natural gas demand would be higher than under existing conditions, largely attributable to R&D uses at HPS Phase II. Natural gas use would be roughly five times higher at HPS Phase II than at Candlestick Point due to peak daytime demand from R&D uses. However, on a per-square-foot basis, the Housing Variant would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

However, because the Housing Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Housing Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts to less than significant.

All natural gas impacts would be less than significant, similar to the Project.

Similar to the Project, the Housing Variant would increase trips to and from the site, increasing the use of petroleum fuels. However, this consumption would not be wasteful because (1) the Housing Variant proposes to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements, (2) the Housing Variant would include a transportation demand management (TDM) program designed to reduce the remaining vehicle trips, and (3) the Housing Variant would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. Therefore, the Housing Variant would result in a less-than-significant impact due to the wasteful use of transportation-related fuels, similar to the Project.

Table IV-32 Housing Variant Natural Gas Demand, Baseline (MBtu)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)*[a]	*Development Program*[b]	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Development Program*[b]	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Development Program*	*MBtu Consumed Annually, 2008 Title 24 Standards*[c]	*MBtu Consumed Annually, with 15% Reduction*	*Percent of Total by Land Use*
Residential Units	0.0360[d]	7,850	283	240	2,650	95	81	10,500	378	321	1%
Retail	0.0048	635,000	3,048	2,591	—	—	—	635,000	3,048	2,591	5%
Neighborhood Retail	0.0048	125,000	600	510	125,000	600	510	250,000	1,200	1,020	2%
Office	0.0200	150,000	3,000	2,550	—	—	—	150,000	3,000	2,550	5%
R&D	0.0200	—	—	—	2,500,000	50,000	42,500	—	50,000	42,500	76%
Hotel	0.0345	220	8	6	—	—	—	220	8	6	0%
Artist Studios/ Center	0.0200	—	—	—	225,000	4,500	3,825	225,000	4,500	3,825	7%
Community Space	0.0200	50,000	1,000	850	50,000	1,000	850	100,000	2,000	1,700	3%
Arena	0.0243	75,000	1,823	1,549	—	—	—	75,000	1,823	1,549	3%
Total			***9,761***	***8,297***		***56,909***	***47,766***		***66,670***	***56,063***	***100%***
Percent of Total			***15%***			***85%***			***100%***		

SOURCES:

Baseline Housing Variant natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The natural gas factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16. The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

b. Based on buildout floor areas provided in Table IV-19 of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

d. The natural gas factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, July 2009, Table 3-8. The factor is in the "Natural Gas Delivered, Total" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

e. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

Greenhouse Gas Emissions

As shown in Table IV-19, the Housing Variant would relocate housing from Candlestick Point to HPS Phase II and no stadium would be constructed. Overall, the level of residential development under this alternative would be the same as the Project. In addition, it should be noted that while the level of neighborhood retail would remain the same, it would be distributed differently throughout the project site. Construction impacts would be substantially similar to the Project. Operational impacts would be similar than those identified under the Project as the redistribution of land uses would result in similar GHG emissions.

Construction

As stated above, overall construction impacts of the Housing Variant with respect to climate change and GHG emissions would be similar to the Project. Construction activities would occur from the use of construction equipment, workers commuting, and soil hauling activities. The GHG emissions associated with the construction activities are short-term in duration and would be a total of 129,274 tonnes CO_2e. When this is distributed over an anticipated time schedule of 20 years, approximately 6,464 tonnes per year would be emitted. Since these emissions are short in duration and small in comparison to the overall construction and mining emissions for the San Francisco Bay Area Air Basin GHG emission inventory, the Housing Variant GHG emissions for construction would be less than significant, similar to the Project.

Operation

Operational impacts to climate change and GHG emissions would be substantially similar to the Project. Under the Housing Variant, the football stadium proposed under the Project would be replaced with relocated housing units at the HPS Phase II site that would decrease the housing units at Candlestick Point. This does not result in any additional units as compared to the Project, but rather redistribution between Candlestick Point and HPS Phase II site. The breakdown in operational GHG emissions for HPS Phase II is shown in Table IV-33 (Housing Variant Annual GHG Emissions).

Table IV-33 Housing Variant Annual GHG Emissions

Source	*Candlestick Point (tonnes CO_2e/year)*	*Hunters Point Shipyard Phase II (tonnes CO_2e/year)*	*Total (tonnes CO_2e/year)*
Residential	15,651	10,026	25,677
Non-Residential	4,263	11,963	16,226
Mobile	75,180	34,888	110,068
Municipal	1,066	1,488	2,553
Area	132	85	217
Waste	451	587	1,038
Transit Area	865	865	1,730
Total (annual emissions)	***97,608***	***59,901***	***157,509***

SOURCE: ENVIRON 2009.

The operational emissions were compared to ARB Scoping Plan No Action Taken Scenario which assumes the site would be developed without implementation of conceptual design features and using regulations in place at the time of the Scoping Plan development. The Housing Variant shows large reductions in GHG emissions due to the mitigation measures that would be implemented. The comparison of the Housing Variant GHG emissions to the ARB Scoping Plan No Action Taken scenario is shown in Table IV-34 (Annual GHG Emissions Comparison of Housing Variant and ARB Scoping Plan No Action Taken Scenario). This shows that due to the improvement in electricity carbon intensity and energy efficiency of the buildings residential GHG emissions would have a 20 percent reduction in emissions and non-residential buildings would have a 15 percent reduction in emissions. Municipal sources are anticipated to be 7 percent lower than the ARB Scoping Plan No Action Taken as a result of reductions in electricity carbon intensity. Mobile source emissions associated with the Housing Variant are a result of trip reductions in automobiles and vehicle emission efficiency regulations resulting in 57 percent reductions compared to the ARB Scoping Plan No Action Taken scenario.

Table IV-34 Annual GHG Emissions Comparison of Housing Variant and ARB Scoping Plan No Action Taken Scenario

Source	*No Action Taken*	*Housing Variant*	*Difference*	*Percent Difference*
Residential	32,286	25,677	6,609	20%
Non-Residential	19,186	16,226	2,960	15%
Mobile	257,568	110,068	147,500	57%
Municipal	2,750	2,553	197	7%
Area	217	217	0	0%
Waste	1,038	1,038	0	0%
Transit Area	2,884	1,730	1,154	40%

SOURCE: ENVIRON 2009. Climate Change Technical Report Candlestick Point-Hunters Point Shipyard Phase II Redevelopment Plan. Table 4-10.

Emissions associated with new public transportation added to the development would have a 40 percent reduction due to the use of diesel-hybrid buses. Since transportation is one of the largest emissions categories in both the statewide and local GHG emissions inventory, the amount of reduction is substantial in the overall reductions anticipated for the Housing Variant. Furthermore, most of the other larger categories also result in substantial reductions in emissions. This indicates that the Housing Variant would not impede the achievement of San Francisco's GHG emission reduction ordinance nor the statewide emission reductions required under AB 32. Therefore, the Housing Variant is less than significant with respect to the cumulative impacts of climate change and GHG emissions.

BAAQMD Draft GHG Thresholds

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the

Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Variant's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the Variant and Project.

With mitigation, the Housing Variant-related operational emissions of 157,509 tonnes per year result in 4.6 tonnes CO_2e per service population per year based on a service population of 34,248 (this accounts for 23,869 net new residents and all 10,379 jobs). Therefore, the Project-related operational emissions would be equal to the 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change.

IV.Ca VARIANT 2A: HOUSING/R&D VARIANT (NO STADIUM—RELOCATION OF HOUSING; ADDITIONAL R&D)

IV.Ca.1 Overview

An option to Variant 2 (Housing Variant)—Variant 2A (Housing/R&D Variant)—has been identified that would allow for additional R&D on the stadium site, along with housing, in the event the 49ers do not choose to develop a stadium in the HPS Phase II area. As compared to the Housing Variant (Variant 2), described on pages IV-72 through IV-81 of the Draft EIR), the Housing/R&D Variant (Variant 2A) would relocate 275 residential units from Candlestick Point to HPS Phase II and redistribute 50 residential units within other districts on Candlestick Point. The Housing/R&D Variant (Variant 2A) would not develop the uses in the Jamestown District that would occur under the Housing Variant (Variant 2). If the parcels on the privately owned block in the Jamestown District and the four additional blocks in Candlestick Point North District (currently vacant or developed with an RV park) are not acquired by the Project Applicant, the property owners could develop their property under the BVHP Redevelopment Plan via an Owner Participation Agreement or continue the current non-conforming use. The total amount of residential development would remain at 10,500 units, the same as for the Project and the Housing Variant (Variant 2).

An additional 500,000 sf of R&D use would be constructed on the stadium site as compared to the Housing Variant (Variant 2), for a total of 3,000,000 sf of R&D at the HPS Phase II site. The Project includes 2,500,000 sf of R&D, the R&D Variant (Variant 1) includes 5,000,000 sf of R&D, and the Housing Variant (Variant 2) analyzes 2,500,000 sf of R&D; therefore, the 3,000,000 sf of R&D under the Housing/R&D Variant (Variant 2A) would fall within the range of development programs analyzed by the R&D Variant (Variant 1), the Project, and the Housing Variant (Variant 2).

The total amount of park acreage with the Housing/R&D Variant (Variant 2A) would be 326.6 acres, which represents a decrease of approximately 9.8 acres as compared to the Project (which would provide 336.4 acres), about 22.8 acres less than the Housing Variant (Variant 2), which would provide 349.4 acres, and 0.4 acre less than the R&D Variant (Variant 1), which would provide 327.0 acres, because of increased development on the stadium site. However, the decrease in park acreage would not reduce park acreage below the identified threshold of 5.5 acres of park per 1,000 residents, as further described in this section.

Table IV-19a (Housing/R&D Variant [Variant 2A] Land Use Summary) presents the land use summary for the Housing/R&D Variant. Figure IV-7a (Housing/R&D Variant [Variant 2A] Land Use Plan) illustrates the proposed Housing/R&D Variant (Variant 2A) land uses.

Table IV-19a Housing/R&D Variant (Variant 2A) Land Use Summary

Land Use	*Candlestick Point*	*HPS Phase II*	*Total*
Residential[a]			
Residential Density Range I (15 to 75 units per acre)	940	1,320	2,260
Residential Density Range II (50 to 125 units per acre)	3,855	2,185	6,040
Residential Density Range III (100 to 175 units per acre)	270	460	730
Residential Density Range IV (175 to 285 units per acre)	1,160	310	1,470

Table IV-19a Housing/R&D Variant (Variant 2A) Land Use Summary

Land Use	*Candlestick Point*	*HPS Phase II*	*Total*
Total (units)	***6,225[b]***	***4,275[c]***	***10,500***
Retail			
Regional Retail (gsf)	635,000	N/A	635,000
Neighborhood Retail (gsf)	125,000	125,000	250,000
Total (gsf)	***760,000***	***125,000***	***885,000***
Office (gsf)	150,000	N/A	150,000
Research & Development	***N/A***	***3,000,000***	***3,000,000***
Hotel (gsf)	150,000	N/A	150,000
Rooms	220	N/A	220
Artists' Studios/Art Center (gsf)	N/A	255,000	255,000
Community Services (gsf)[d]	50,000	50,000	100,000
Parks & Open Space			
New Parks (acres)	8.1	150.9	159.0
New Dual-Use Sports Fields/Multi-Use Lawn and Stadium Parking and Waterfront Recreation (acres)	N/A	70.9	70.9
New and Improved State Parkland (acres)	96.7	N/A	96.7
Total (acres)	***104.8***	***221.8***	***326.6***
Marina (slips)	N/A	300	300
Performance Venue/Arena (gsf)	75,000	N/A	75,000
Seats	10,000	N/A	10,000
Parking (spaces)			
Residential (structured)	6,225	4,275[e]	10,500
Commercial (structured)	2,346	4,428	6.774
General and Commercial (on-street)	1,360	1,428	2,788

SOURCE: Lennar Urban, 2010.

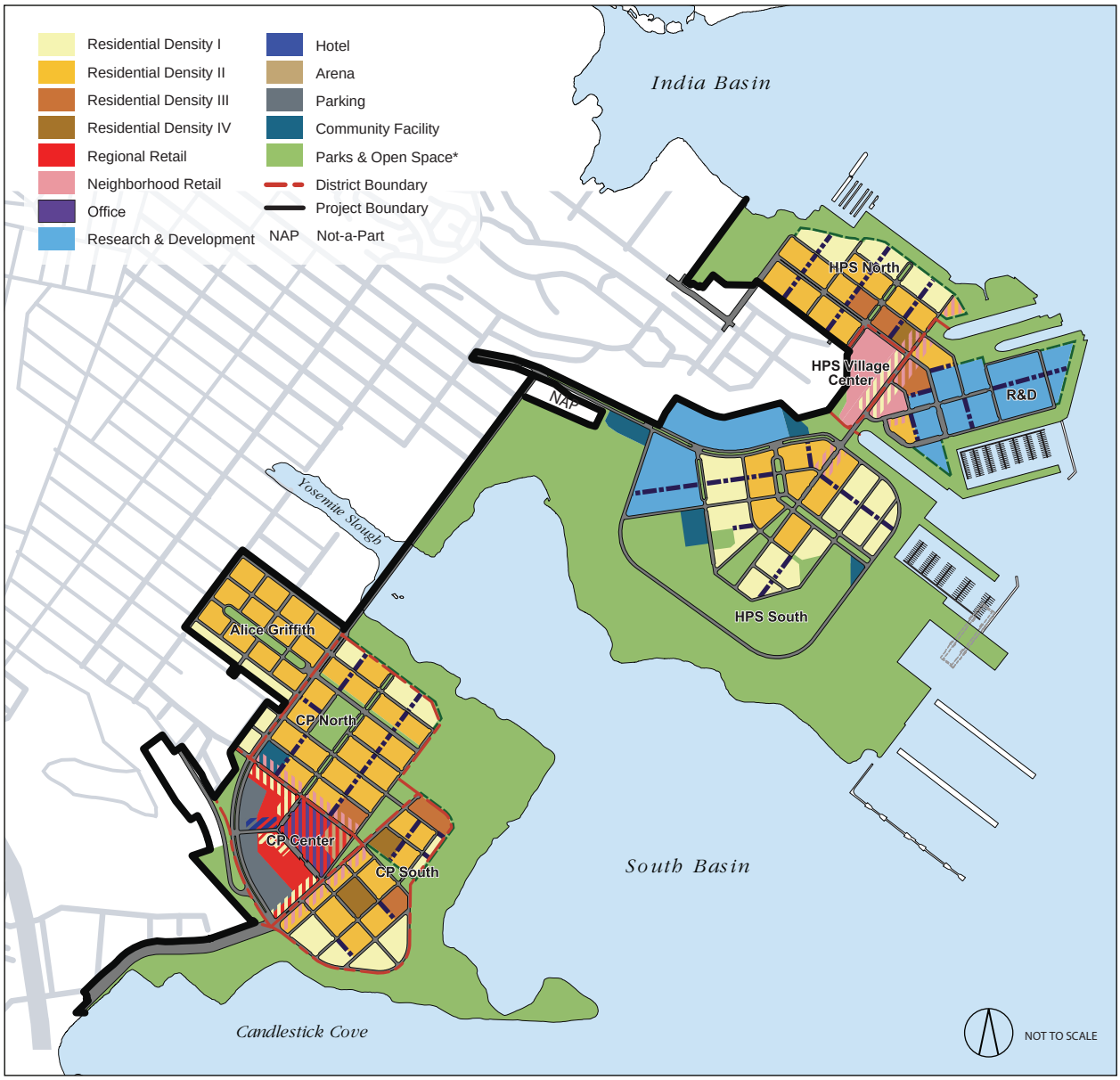
a. The number of residential units in each district may be adjusted depending on market demand; however, the total of housing units for Candlestick Park would not exceed 6,225 units and the total number of housing units for HPS Phase II would not exceed 4,275 units.

b. 1,625 units less than the Project (moved to HPS Phase II).

c. 1,625 units more than the Project (moved from Candlestick Point).

d. Community facilities parcels are intended to provide the existing BVHP community and the future Project community with dedicated land for uses designed to provide, preserve, and leverage such critical local resources as social services, education, the arts, other community services (including public safety facilities such as fire and police stations), and facilities for the benefit of senior citizens. Additional uses proposed for the community facilities parcels such as retail, services, offices, and R&D space, beyond the 100,000 proposed for community facilities, would be absorbed within the retail or R&D program proposed in HPS Phase II. Total uses would not exceed those amounts identified in this table.

e. Residential parking at HPS Phase II would be increased compared to the Project to provide parking for the additional residential units and R&D.



SOURCE: Lennar Urban, 2010.

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FIGURE IV-7a

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING/R&D VARIANT (VARIANT 2A) LAND USE PLAN

There would be no new significant environmental impacts or an increase in the severity of impacts compared to the impacts analyzed for the Project, R&D Variant (Variant 1), or the Housing Variant (Variant 2) as a result of the modification presented by the Housing/R&D Variant (Variant 2A). An environmental analysis of these modifications, with associated illustrative graphics, is contained in this section.

IV.Ca.2 Project Objectives

The objectives for the Housing/R&D Variant (Variant 2A) would be the same as for the Project. A full list of Project objectives is provided in Section II.D of this EIR. In particular, the Housing/R&D Variant (Variant 2A) was prepared to address the following portion of Objective 1:

- Implement the CP-HPS Development Plan with public benefits, whether or not the 49ers decide to remain in San Francisco, including developing alternate uses for the stadium site on the Shipyard Property that are consistent with the overall CP-HPS Development Plan objectives.

IV.Ca.3 Characteristics

Section II.E outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. While many of these components of the Project would also apply to this variant, the discussion below outlines the principal differences.

Land Use Plan

The land use program outlined in Chapter II (Project Description) for Candlestick Point would generally be the same for this Housing/R&D Variant (Variant 2A) as for the Project, with the exception that 1,625 residential units that would have been constructed on Candlestick Point would be relocated to HPS Phase II. The total number of residential units to be developed would remain the same at 10,500. The discussion below is focused on the changes that would occur at HPS Phase II, relative to the Project, the R&D Variant (Variant 1), and the Housing Variant (Variant 2).

The changes proposed with the Housing/R&D Variant (Variant 2A) compared to the Project include residential, R&D, and neighborhood commercial land uses for the HPS South district and the same small reductions in neighborhood commercial uses in other HPS Phase II districts as noted for the Housing Variant (Variant 2). One thousand, six hundred and twenty-five residential units would be relocated to HPS Phase II from Candlestick Point compared to the Project, but the overall total number of residential units would remain the same (i.e., 10,500) as under the Project. The Housing/R&D Variant (Variant 2A) would include 3,000,000 sf of R&D, which is 500,000 sf more when compared to the Project and the Housing Variant (Variant 2) and 2,000,000 sf less than under the R&D Variant (Variant 1). All other land uses within the HPS Phase II districts would be the same as the Project, as described in detail in Chapter II (Project Description). A summary of the development in HPS Phase II proposed with the Housing/R&D Variant (Variant 2A) is provided in Table IV-20a (Housing/R&D Variant [Variant 2A] HPS Phase II Land Use Summary). Figure IV-8a (Housing/R&D Variant [Variant 2A] Maximum Building Heights) illustrates the maximum building heights for Variant 2A.

Table IV-20a Housing/R&D Variant [Variant 2A] HPS Phase II Land Use Summary

District	*Net Acres*[a]	*Dwelling Units*[b,c]	*Density*	*Neighborhood Retail (gsf)*	*Artist Space (gsf)*	*R&D (gsf)*	*Community Services (gsf)*	*Total Commercial (gsf)*
Hunters Point Shipyard North	26.88	2,090	I, II, III, IV	18,000[d]	0	0	0	18,000
Hunters Point Shipyard Village Center	7.69	125	I, II, III	20,000[e]	255,000	0	0	275,000
Research & Development	26.75	435	II, III	62,000[f]	0	2,000,000	0	2,062,000
Hunters Point Shipyard South	61.24[g]	1,625[h]	I, II	25,000[i]	0	1,000,000	50,000	1,075,000
Total	***122.56***	***4,275[h]***	***N/A***	***125,000***	***255,000***	***3,000,000***	***50,000***	***3,430,000***

SOURCE: Lennar Urban, 2009.

a. Net Acreage excludes the street network.

b. 1,320 Residential Density Range I (15 to 75 units per net acre)
2,185 Residential Density Range II (50 to 125 units per net acre)
460 Residential Density Range III (100 to 175 units per net acre)
310 Residential Density Range IV (175 to 270 units per net acre)
4,275 Total units

c. The number of residential units in each district may be adjusted depending on market demand; however, the total of housing units for HPS Phase II would not exceed 4,275 units.

d. 7,000 gsf less than the Project.

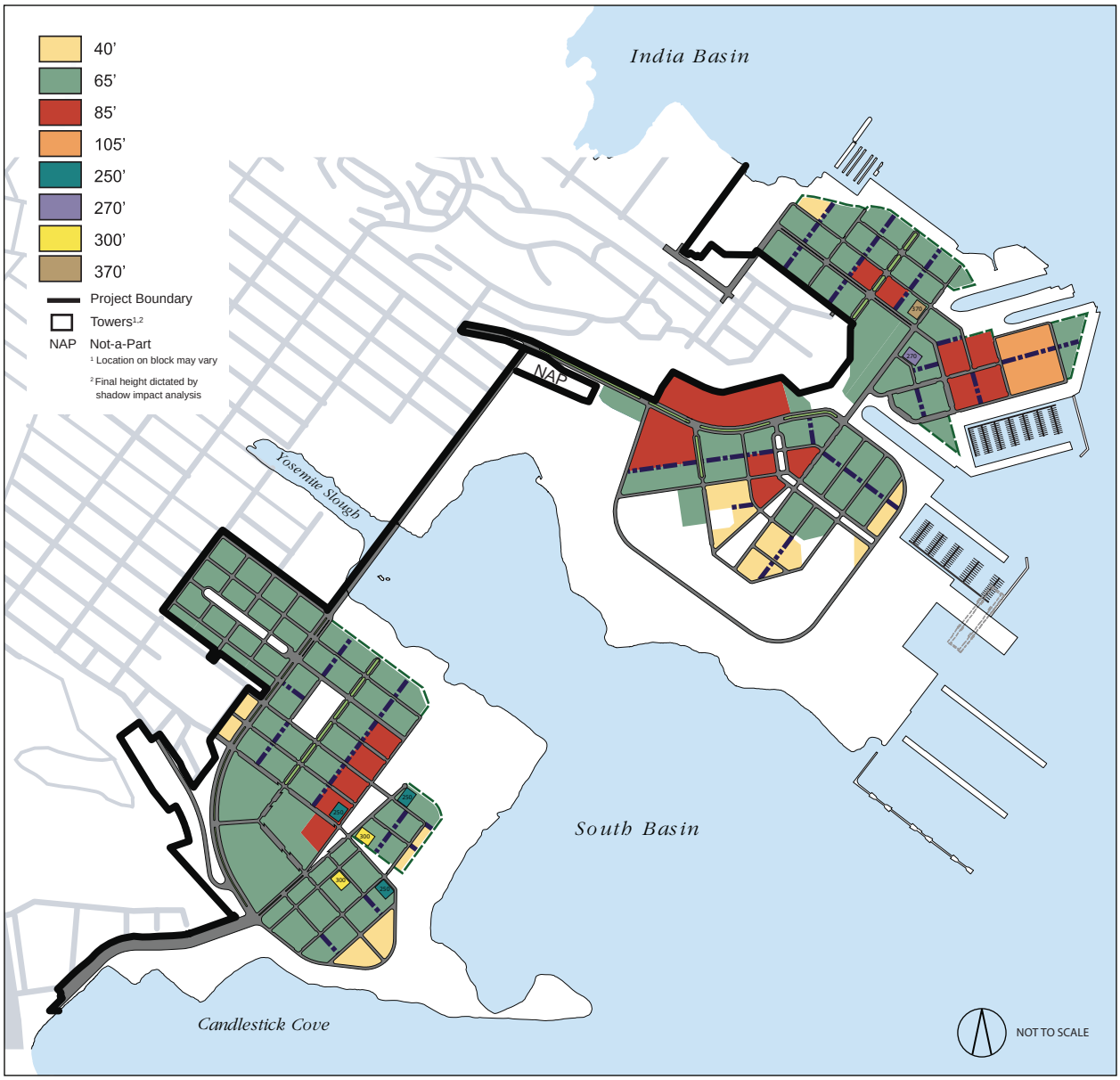
e. 5,000 gsf less than the Project.

f. 13,000 gsf less than the Project.

g. The net acreage of the HPS South district would be increased compared to the Project (32.26 acres with stadium).

h. 1,625 units more than the Project.

i. 25,000 more than the Project.



SOURCE: Lennar Urban, 2010.

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FIGURE IV-8a

HOUSING/R&D VARIANT (VARIANT 2A)
MAXIMUM BUILDING HEIGHTS

With the Housing/R&D Variant (Variant 2A), the 69,000-seat NFL stadium proposed with the Project would not be constructed in the HPS South district. Instead, the Housing/R&D Variant would result in construction of 1,625 dwelling units at Density Ranges I and II and 1,000,000 sf of R&D in the HPS South district. The Project includes no residential or R&D in this district. In addition, with the Housing/R&D Variant, the HPS South district would develop 25,000 gsf of neighborhood retail, while the Project would not develop any neighborhood retail adjacent to the stadium.

Parks and Open Space at HPS Phase II

The Housing/R&D Variant (Variant 2A) parks and open space on Candlestick Point would be the same as for the Project; this discussion focuses on HPS Phase II changes. The Housing/R&D Variant (Variant 2A) would include additional parks and would reconfigure the design and sizes of parks and open space areas at HPS Phase II compared to the Project. As presented in Table IV-21a (Housing/R&D Variant [Variant 2A] HPS Phase II Parks and Open Space), HPS Phase II would have 221.8 acres of parks and open space compared to the 230 acres on HPS Phase II under the Project. The Sports Field Complex proposed with the Housing/R&D Variant (Variant 2A) would be 39 acres, which is approximately 20 acres less than proposed with the Project. The 2.0-acre Hunters Point South Park, 0.7-acre Hunters Point Mini Park, 0.9-acre Hunters Point Neighborhood Park, and 3.1-acre Hunters Point Wedge Park would be constructed in the HPS South district, which is not included in the Project. Table IV-21a presents the proposed park and open space at HPS Phase II in the Housing/R&D Variant (Variant 2A).

Table IV-21a Housing/R&D Variant (Variant 2A) HPS Phase II Parks and Open Space

Park/Open Space		*Acres*
New Parks		
Northside Park		12.8
Waterfront Promenade		32.4
Heritage Park		15.6
Grasslands Ecology Park at Parcel E		45.2
Grasslands Ecology Park at Parcel E-2		38.2
Hunters Point Wedge Park		3.1
Hunters Point South Park		2.0
Hunters Point Neighborhood Park		0.9
Hunters Point Mini Park		0.7
	Subtotal	*150.9*
New Sports Fields and Active Urban Recreation		
Sports Field Complex		39.0
Multi-Use Lawn		25.2
Waterfront Recreation & Event Pier		6.7
	Subtotal	*70.9*
	Total	***221.8***

SOURCE: Lennar Urban 2010.

Figure IV-9a (Housing/R&D Variant [Variant 2A] Parks and Open Space) illustrates the location of the proposed parks and open space. Figure IV-10a (Housing/R&D Variant [Variant 2A] Building and Park

Construction Schedule) provides phasing and construction information for development of the buildings and parks under Variant 2A.

Transportation and Circulation

The transportation and circulation plan under the Housing/R&D Variant (Variant 2A) would be the same as proposed for the Housing Variant (Variant 2).

Infrastructure

The location of major infrastructure improvements under the Housing/R&D Variant (Variant 2A) would be the same as that proposed for the Housing Variant (Variant 2).

Implementation

Build-out of the housing and R&D uses at HPS Phase II would begin in the first phase of development and would be completed by 2027. Figure IV-10a illustrates the overall sequence of development for the Housing/R&D Variant (Variant 2A).

IV.Ca.4 Potential Environmental Effects

Analytic Method

The Housing/R&D Variant (Variant 2A) represents a modification of the Housing Variant (Variant 2) and also includes components of the R&D Variant (Variant 1). The R&D Variant (Variant 1) analyzes 5,000,000 sf of R&D on the stadium site and the Housing/R&D Variant (Variant 2A) contemplates 3,000,000 sf of R&D on the stadium site. The Housing Variant (Variant 2) proposes relocating 1,350 residential units to HPS Phase II, and the Housing/R&D Variant (Variant 2A) contemplates relocating 1,625 residential units to HPS Phase II.

For environmental resources that are dependent on types of land uses, rather than size, (Land Use and Plans, Hazards and Hazardous Materials, and, to some extent, Utilities and Energy) it would be appropriate to compare the impacts of the Housing/R&D Variant (Variant 2A) to those impacts analyzed for the R&D Variant (Variant 1) and/or the Housing Variant (Variant 2) to demonstrate that the impacts from the Housing/R&D Variant (Variant 2A) are "bracketed" within the range of impacts already analyzed.



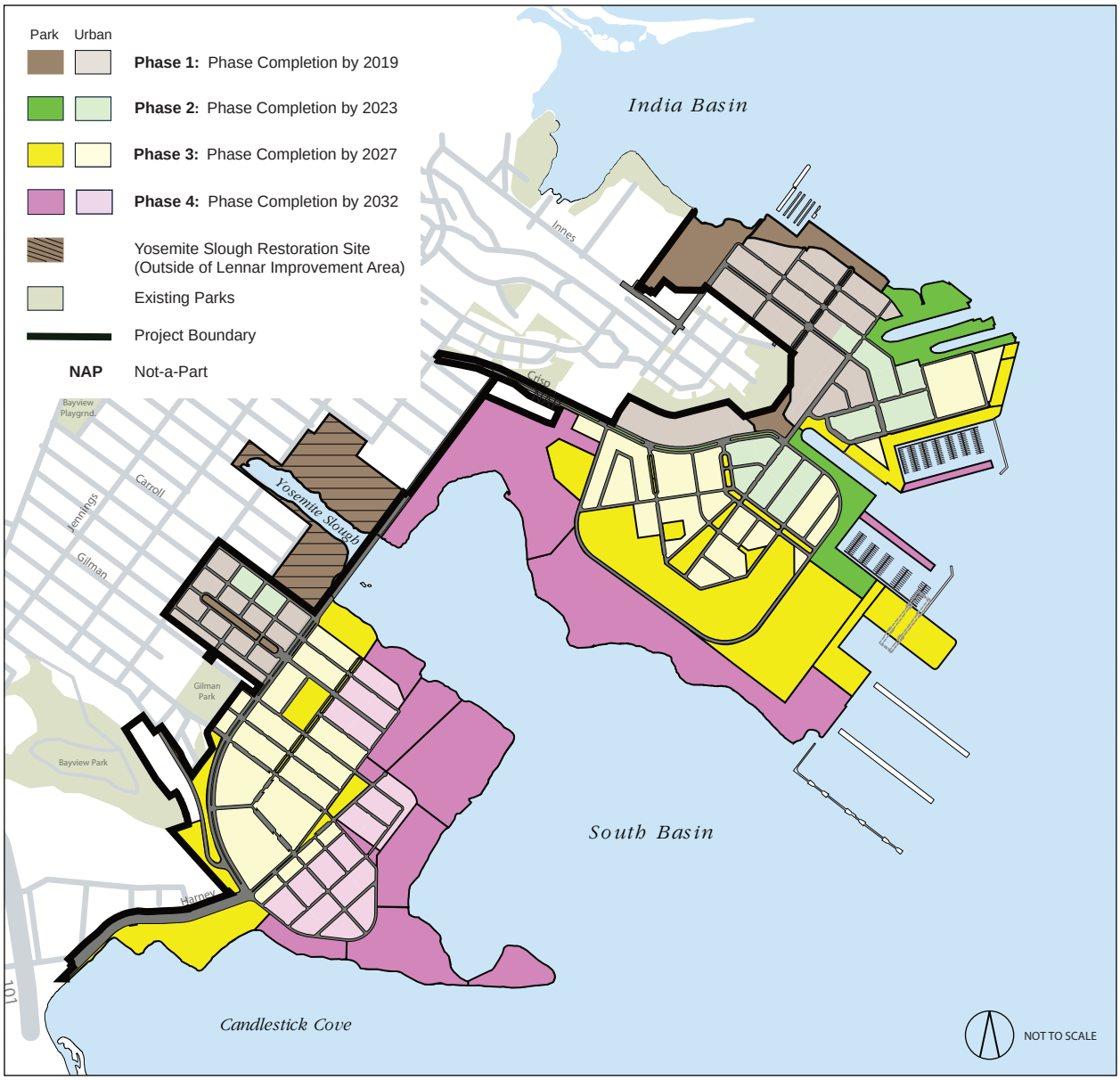
SOURCE: Lennar Urban, RHAA, 2010.

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HOUSING/R&D VARIANT (VARIANT 2A) PARKS AND OPEN SPACE

FIGURE IV-9a



SOURCE: Lennar Urban, 2010.

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FIGURE IV-10a

HOUSING/R&D VARIANT (VARIANT 2A)
BUILDING AND PARK CONSTRUCTION SCHEDULE

The footprint of development for Variant 2A is approximately the same as that of the R&D Variant (Variant 1) but slightly less than that of the Project.[1263] The Housing/R&D Variant (Variant 2A) would result in a total of 46.8 percent area of impervious surface (an indicator of development footprint) on HPS; the Project would result in total impervious surface area on HPS of 48.4 percent; and the R&D Variant (Variant 1) would have total impervious surface area on HPS of 46.7 percent. For environmental resources whose impacts depend on the extent or intensity of development and extent of ground disturbance (Cultural/Paleontological Resources, Hazards and Hazardous Materials, Geology and Soils, Hydrology and Water Quality), it would be appropriate to compare the impacts of the Housing/R&D Variant (Variant 2A) to the Project, as the Project's development "footprint" is slightly greater than the footprint of the Housing/R&D Variant (Variant 2A). The location of development would remain the same under the Housing/R&D Variant (Variant 2A) and the impact conclusions made for the Project that also depend on the specific location of development (Biological Resources and Cultural/Paleontological Resources) would also apply to Variant 2A. Thus, the impacts of the Housing/R&D Variant (Variant 2A) have been bracketed by the impacts analyzed for the Project with respect to Cultural Resources and Paleontological Resources, Hazards and Hazardous Materials, Geology and Soils, Hydrology and Water Quality, and Biological Resources. Impacts of the Housing/R&D Variant (Variant 2A) that are dependent on intensity of development or extent of land disturbance would be substantially the same as the impacts for the development proposed for the Project.

With respect to Wind and Shadow impacts, which are dependent on the heights and massing of structures, building heights and massing for the Housing/R&D Variant (Variant 2A) would be substantially similar to the Project, and within the height limits established by the Project districts. Therefore, the impacts of the Housing/R&D Variant (Variant 2A) for these topics would be appropriately compared to the impacts of the Project.

For Transportation and Circulation, Aesthetics, Air Quality, Noise, Recreation, and Greenhouse Gas Emissions, the combination of housing and R&D on the stadium site and development schedule modifications require a somewhat more comprehensive analysis to determine the impacts of the Housing/R&D Variant (Variant 2A) compared to the Project, the R&D Variant (Variant 1), or the Housing Variant (Variant 2).

Therefore, the impacts of the Housing/R&D Variant (Variant 2A) are analyzed in the following sections compared to the impacts of the Project, Variant 1, and/or Variant 2, whichever is the most appropriate for the particular resource, to demonstrate that the impacts of Variant 2A would be bracketed by one or more of the analyses previously provided in the EIR.

Construction Impacts

Potential construction-related environmental effects of the Housing/R&D Variant (Variant 2A) would be approximately the same as those analyzed for the R&D Variant (Variant 1), as it would include approximately the same intensity of development. Therefore, all construction-related environmental effects of the Housing/R&D Variant (Variant 2A) are the same as contained in the analysis of the R&D Variant on pages IV-14 through IV-73 of the EIR.

[1263] IBI Group, April 8, 2010.

Depending on the phasing of the additional development, the Housing/R&D Variant (Variant 2A) may result in fewer construction traffic impacts between future years 2012 and 2017, when the new stadium would be constructed, and somewhat greater impacts in the years the housing and additional R&D would be constructed. Implementation of a Construction Traffic Management Program (the same as described for the Project in mitigation measure MM TR-1) would help minimize the Housing/R&D Variant's contribution to cumulative construction-related traffic impacts. However, localized construction-related traffic impacts would remain significant and unavoidable, similar to the Project, and would be bracketed by the analysis for the Project.

With regard to air quality, construction activities would occur over the same construction period and would be essentially the same as those identified for the Project and the R&D Variant (Variant 1). Any project within the City of San Francisco, including the Housing/R&D Variant, would be required to comply with *San Francisco Health Code* Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). Implementation of mitigation measure MM HZ-15, which identifies specific mitigation that would be used to reduce emissions associated with construction. As the development footprint of the Housing/R&D Variant (Variant 2A) would be substantially similar to and have been "bracketed by" the analyses for the Project and the R&D Variant (Variant 1), impacts would be less than significant as previously identified in the analyses of construction air quality impacts for the Project and the R&D Variant (Variant 1), and would be bracketed by the impact analysis for the Project and the R&D Variant (Variant 1).

With respect to airborne human health risks, construction measures MM AQ-2.1 and MM AQ-2.2 would be implemented for the Housing/R&D Variant (Variant 2A), reducing diesel particulate matter (DPM) and dust or particular matter (PM_{10}) to less than significant. As construction emissions associated with the Housing/R&D Variant (Variant 2A) are expected to be lower than those associated with construction of a stadium in the same location (e.g., Project), the Housing/R&D Variant (Variant 2A) would have reduced impacts compared to the Project. Refer to Appendix T4 (ENVIRON, Updated Air Quality Analysis Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3 [Tower Variant D], Alternative 2, and Subalternative 4A, April 26, 2010). The Health Risk Assessment (HRA) performed for the Project (Appendix H3 to the EIR) concluded that the inhalation cancer risk at the Maximum Extent of Impact (MEI) for the Project would be 4.5 in one million. This represents the maximum level of DPM experienced by all off-site and on-site (i.e., Alice Griffith) sensitive receptors during Project construction activities. Exposure to DPM from construction activities associated with the Project would not exceed the BAAQMD threshold. The Housing/R&D Variant (Variant 2A) is not anticipated to exceed Project impacts and, therefore, would not exceed the BAAQMD CEQA threshold. In addition, the HRA concluded the maximum chronic noncancer HI to be 0.01, which is below the BAAQMD's HI significance threshold of 1.0. Therefore, this impact would be bracketed by the impact analyzed in the Project, and would similarly be less than significant.

The HRA for the Project analyzed the potential for construction activities to generate toxic air contaminants (TACs) associated with soil-PM_{10} and evaluated the potential concentrations of airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult

and child residents, workers, and schoolchildren) in the Project vicinity. The inhalation cancer risk at the point of maximum impact or MEI as a result of construction activities at the Project site would be 0.04 in one million and would not exceed the BAAQMD threshold, similar to the Project. In addition, the HRA concluded the maximum non-cancer HI to be 0.03, which would be below the BAAQMD's significance threshold of 1.0. The impacts of the Housing/R&D Variant (Variant 2A) would be bracketed by the analysis for the Project.

All construction-related mitigation measures outlined for the Project would also apply to the Housing/R&D Variant (Variant 2). These include: MM TR-1, MM AE-2, MM AQ-2.1, MM AQ-2.2, MM NO-1a.1, MM NO-1a.2, MM NO-2a, MM CP-1b.1, MM CP-2a, MM CP-3a, MM HZ-1a, MM HZ-1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM GE-2a, MM GE-3, MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, MM GE-6a, MM GE-10a, MM GE-11a, MM HY-1a.1, MM HY-1a.2, MM HY-1a.3, MM HY-6a.1, MM HY-12a.1, MM HY-12a.2, MM HY-14, MM BI-4a.1, MM BI-4a.2, MM BI-5b.1, MM BI-5b.3, MM BI-5b.4, MM BI-6a.1, MM BI-6a.2, MM BI-6b, MM BI-9b, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, MM BI-12b.2, MM BI-14a, MM PS-1, MM UT-3a, and MM UT-5a. (Refer to Table ES-2.)

Operational Impacts

Land Use and Plans

The Housing/R&D Variant (Variant 2A) would develop 3,000,000 sf of R&D on the HPS Phase II site, which is 2,000,000 less square footage than the R&D Variant (Variant 1). However, 1,625 additional housing units and 500,000 additional sf of R&D compared to the R&D Variant (Variant 1) would be constructed on HPS Phase II on the stadium site. The impacts of the types of land uses proposed for the stadium site under the Housing/R&D Variant (Variant 2A) have been analyzed in both the R&D and Housing Variant analyses contained on pages IV-12 through IV-139 of the Draft EIR.

The Housing/R&D Variant (Variant 2A) would not introduce any new land uses that were not analyzed in the R&D and Housing Variants. The residential units and R&D would be located on the stadium site, the same as for the R&D and Housing Variants, and would not divide an established community. The Housing/R&D Variant (Variant 2A) would not conflict with any policies of applicable land use plans or result in urban decay, as analyzed for the R&D and Housing Variants, as the proposed uses and densities are within the range of development analyzed for the R&D and Housing Variants. The impacts would be less than significant, similar to the R&D and Housing Variants.

Population, Housing, and Employment

The Housing/R&D Variant (Variant 2A) would result in construction of the same number of dwelling units as the Project (10,500), with the same resulting resident population increase. The Housing/R&D Variant (Variant 2A) would generate 11,629 jobs,[1264] less than the 16,635 jobs estimated for the R&D Variant (Variant 1), but more than for the Project. Therefore, impacts related to population, housing, and employment would be bracketed by the analysis for the Project and Variant 1, and would be similarly less than significant.

[1264] Utilizing generation factor of one job for every 4,000 sf.

Transportation and Circulation

Overall, the Housing/R&D Variant (Variant 2A) would not increase the total amount of residential development compared to the Project, but would relocate approximately 1,625 housing units from Candlestick Point to HPS Phase II, and would add 500,000 gsf of R&D to HPS Phase II. Therefore, 4,275 residential units (rather than 2,650 residential units as under the Project) and 3,000,000 gsf (rather than 2,500,000 gsf as under the Project) of R&D would be developed at HPS Phase II. The Housing/R&D Variant (Variant 2A) would include all uses proposed with the Project with the exception of the stadium, which would be replaced by the relocated housing units and additional R&D. There would be no football stadium. Therefore, the Housing/R&D Variant (Variant 2A) would not have game day or other stadium event transportation impacts associated with the Project. The Housing/R&D Variant (Variant 2A) would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with the Project, including the Yosemite Slough bridge. However, as with all non-stadium variants, the bridge would be narrower than the bridge with the Project, with a 41-foot-wide right-of-way to accommodate two BRT lanes, a sidewalk, and a Class I bicycle path.

As with the Project, the Housing/R&D Variant (Variant 2A) would implement a Transportation Demand Management plan as described in Project mitigation measure MM TR-2 and a Transit Operating Plan as described in Project mitigation measure MM TR-17.

A transportation analysis was conducted for the Housing/R&D Variant (Variant 2A) and key conclusions are presented below. The analysis is provided as Appendix T6 (LCW Consulting, CP-HPS Phase II Development Plan Transportation Study—Project Variant 2A, March 15, 2010) to this document.

Trip Generation

The Housing/R&D Variant (Variant 2A) would have 220,323 total daily person trips, slightly more than the trips generated with the Project (219,651), but less than the R&D Variant (236,291). Similarly, the Housing/R&D Variant (Variant 2A) would generate slightly more peak hour person trips during both the AM and PM peak hours (14,042 weekday AM trips, 20,727 weekday PM trips, and 18,240 Sunday PM trips) than the Project (13,558 weekday AM trips, 20,412 weekday PM trips, and 18,128 Sunday PM trips), but fewer peak hour trips than the R&D Variant (16,253 weekday AM trips, 22,586 weekday PM trips, and 19,719 Sunday PM trips). Thus, the impacts from the Housing/R&D Variant (Variant 2A with respect to trip generation have been bracketed by the analysis for the Project and the R&D Variant (Variant 1).

Intersection LOS

There are three intersections—Cesar Chavez/Evans, Crisp/Palou, and Bayshore/Oakdale—where the Housing/R&D Variant (Variant 2A) would result in a greater impact than as identified for the Project. The intersections of Crisp/Palou and Bayshore/Oakdale would have a project-level significant impact that does not occur under the Project. At these same two intersections, however, the R&D Variant (Variant 1) was identified to have a significant and unavoidable impact, with greater levels of delay (although same level of service) when compared to the Housing/R&D Variant (Variant 2A). Therefore, for these two intersections, the impacts have been bracketed by the analysis for the Project and for the R&D Variant (Variant 1).

For the intersection of Cesar Chavez/Evans, the Housing/R&D Variant (Variant 2A) would make a significant contribution to cumulative impacts as well as a project-level significant impact compared to the no significant contribution and no significant project-level impact under the Project. For the same intersection, the analysis for the R&D Variant (Variant 1) concluded that there would be a significant contribution and a significant project-level impact, and the contribution from the R&D Variant (Variant 1) would be greater for the R&D Variant (Variant 1) than for the Housing/R&D Variant (Variant 2A). The average delay at this intersection would be less under the Housing/R&D Variant (Variant 2A) than under the R&D Variant (Variant 1). Therefore, for this intersection, the impacts have been bracketed by the analysis for the Project and the R&D Variant (Variant 1).

Freeway Conditions

The Housing/R&D Variant (Variant 2A) would generate more trips than the Project but fewer than the R&D Variant (Variant 1), as noted, above. The Housing/R&D Variant (Variant 2A) effects on freeway mainline sections and freeway ramp junctions would be greater compared to the Project, but less than with the R&D Variant (Variant 1). The Housing/R&D Variant (Variant 2A) ramp queuing effects would be similar to Project effects. The Housing/R&D Variant (Variant 2A) would result in significant impacts with respect to ramp queuing at the same off-ramp locations as the Project, with one exception. With the Housing/R&D Variant (Variant 2A), the US-101 northbound off-ramp to Harney Way would not be likely to experience queues extending back to the mainline in the PM peak hour. However, the Housing/R&D Variant's contribution to other off-ramps expected to experience significant traffic impacts associated with queuing under Project conditions would be the same as the Project. As described for Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant impacts. Impacts of the Housing/R&D Variant (Variant 2A) on freeway conditions would be significant and unavoidable, the same as for the Project and the R&D Variant (Variant 1), except for the one off-ramp location noted where the impact of the Housing/R&D Variant (Variant 2A would be less than significant, compared to the significant and unavoidable impact on this off-ramp under both the Project and the R&D Variant (Variant 1). Thus, the impacts of the Housing/R&D Variant (Variant 2A) with respect to freeway conditions would be bracketed by the impact analysis for the Project and the R&D Variant (Variant 1) as contained in the EIR.

Transit Impacts

The Housing/R&D Variant (Variant 2A), as with the Project, would include extended and new transit services; transit trips with the Housing/R&D Variant (Variant 2A) would be accommodated within the capacity of these services. The Housing/R&D Variant (Variant 2A), as with the Project, would have a less-than-significant impact with mitigation (i.e., implementation of MM TR-27—the Transit Operating Plan) on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with the Housing/R&D Variant (Variant 2A) would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. Project mitigation measures MM TR-21 to MM TR-30 would also apply to the Housing/R&D Variant (Variant 2A), but, as concluded in Section III.D of the EIR, the feasibility or implementation of the measures is uncertain, and the transit delay effects would remain significant and unavoidable. The Housing/R&D Variant (Variant 2A) would require a similar number of additional vehicles on the same routes as the Project to mitigate transit congestion delays. Impacts associated with

the Housing/R&D Variant (Variant 2A) would be more extensive than those for the Project and the Housing Variant (Variant 2), but less than the R&D Variant (Variant 1), and would be significant and unavoidable.

Bicycle Impacts

The Housing/R&D Variant (Variant 2A) bicycle trips would be accommodated within the proposed street and network, and impacts on bicycle circulation would be less than significant.

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under Housing/R&D Variant. Project mitigation measure MM TR-32 would reduce impacts on bicyclists; however, because a feasibility study would be required, the implementation of Project mitigation measure MM TR-32 is uncertain, and, therefore, the Housing/R&D Variant (Variant 2A) impacts on bicycle circulation would remain significant and unavoidable, the same as for the Project.

Pedestrian Impacts

The Housing/R&D Variant (Variant 2A) would be accommodated within the proposed sidewalk and pedestrian network, and impacts on pedestrian circulation would be less than significant.

Parking Impacts

The Housing/R&D Variant (Variant 2A) would result in a demand for about 21,776 spaces, compared with a maximum permitted supply of about 17,274 spaces; therefore, the maximum off-street parking supply would be about 4,502 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. Due to parking supply constraints and accessibility to transit, future Housing/R&D Variant (Variant 2A) parking demand may be somewhat lower than estimated, and, therefore, the parking space shortfall would also be less than the number of spaces that would be required in order to accommodate all the vehicles anticipated if the proposed parking supply were unconstrained. Since the parking supply would be constrained, the actual parking demand would be expected to be less. As discussed in Section III.D, peak parking demand would not occur simultaneously; public parking facilities, such as the one proposed in Candlestick Point, and on-street parking spaces can usually be shared efficiently among many destinations, and the Housing/R&D Variant (Variant 2A) would include a Travel Demand Management program that includes a number of parking strategies to make auto use and ownership less attractive, as well as strategies to encourage alternative modes.

As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. Parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers who are aware of constrained parking conditions in a given area shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall

in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Housing/R&D Variant (Variant 2A) impacts on parking would be less than significant.

The Housing/R&D Variant (Variant 2A) would have less-than-significant effects on other transportation conditions (loading, air traffic, and emergency access).

Arena Impacts

As with the R&D Variant (Variant 1), since the amount of background transit demand under the Housing/R&D Variant (Variant 2A) would be higher than the Project, it is possible that the added transit demand associated with a sold-out arena event would create demand for transit service greater than the capacity of the transit supply to the arena. Project mitigation measure MM TR-51 (Transportation Management Plan for the arena) and MM TR-23.1 (Maintain the proposed headways of the 29-Sunset) would apply to the Housing/R&D Variant (Variant 2A) and would help minimize the impacts. This mitigation requires that SFMTA increase frequency on regularly scheduled Muni routes (primarily the CPX-Candlestick Express) serving the arena area prior to large events at the arena and convert one of the two automobile travel lanes in each direction into a transit-only travel lane on Gilman Avenue between Arelious Walker Drive and Third Street. Additionally, westbound Paul Avenue, between Third Street and Bayshore Boulevard, provides one westbound travel lane and on-street parking. Additional shuttle service to key regional transit destinations, such as BART, Caltrain, and the T-Third light rail route would also be provided by the arena operator. With implementation of the mitigation measure, the Housing/R&D Variant's impacts to transit service would be reduced, but not to less-than-significant levels. In addition, traffic impacts during events at the arena would not be mitigated, and would impact transit operations. Because transit demand would be greater under the Housing/R&D Variant (Variant 2A) compared to the Project and less than the demand under the R&D Variant (Variant 1), the impacts of the Housing/R&D Variant (Variant 2A) have been bracketed in the analysis contained in the EIR for the Project and the R&D Variant (Variant 1).

Aesthetics

Compared to the R&D Variant (Variant 1) and Housing Variant (Variant 2), building heights and massing would appear substantially similar to what was analyzed for those variants. All other urban design and building forms with the Housing/R&D Variant, and resulting effects, would be similar to conditions with the R&D and Housing Variants. Building heights and massing would remain within the parameters analyzed for the R&D and Housing Variants. Building heights would be maintained within the height limits established for the Project districts (refer to Figure IV-8a). There would be new development along the south side of Crisp, which would not occur under the Project, Variant 1, or Variant 2. However, as illustrated in Figure IV-7a and Figure IV-8a, the structures proposed south of Crisp under Variant 2A would not exceed 85 feet in height or be taller than proposed buildings farther east. The area where additional structures (compared to the Project) would be constructed would be limited to a small portion of the site.

The Housing/R&D Variant (Variant 2A) would not introduce new land uses or types of structures that were not previously considered and analyzed with respect to effects on scenic resources. Similarly, as the Housing/R&D Variant (Variant 2A) would develop the same mix of uses on the same site, the impacts to

visual character or quality would be the same as analyzed for the Project, the R&D Variant (Variant 1), and the Housing Variant (Variant 2).

Figure IV-10b through Figure IV-10d provide visual simulations of the general appearance, height, bulk, and location of structures proposed under Variant 2A. Figure III.E-10 (Viewpoint Locations) also identifies Views 16a and 18a. As can be seen, the overall appearance of Variant 2A would be substantially similar to the Project and the other variants. No long- or mid-range views would be blocked and no scenic resources would be affected, similar to the Project and the other variants. As the amount of development would be within the development envelope analyzed for the Project, Variant 1, and Variant 2, and with implementation of the same mitigation measures identified for the Project, impacts from light and glare would be less than significant.

Therefore, the impacts on scenic vistas, scenic resources, visual character, and from light and glare would be less than significant, similar to the Project, the R&D Variant (Variant 1), and the Housing Variant (Variant 2).

Shadow

The buildings proposed under the Housing/R&D Variant (Variant 2A) on the stadium site would be lower in height than those analyzed for the Project; none of the buildings proposed on the stadium site would be greater than the 156-foot height of the proposed stadium as analyzed for the Project. Therefore, shadow impacts of the Housing/R&D Variant (Variant 2A) would be less than the Project and less than significant.

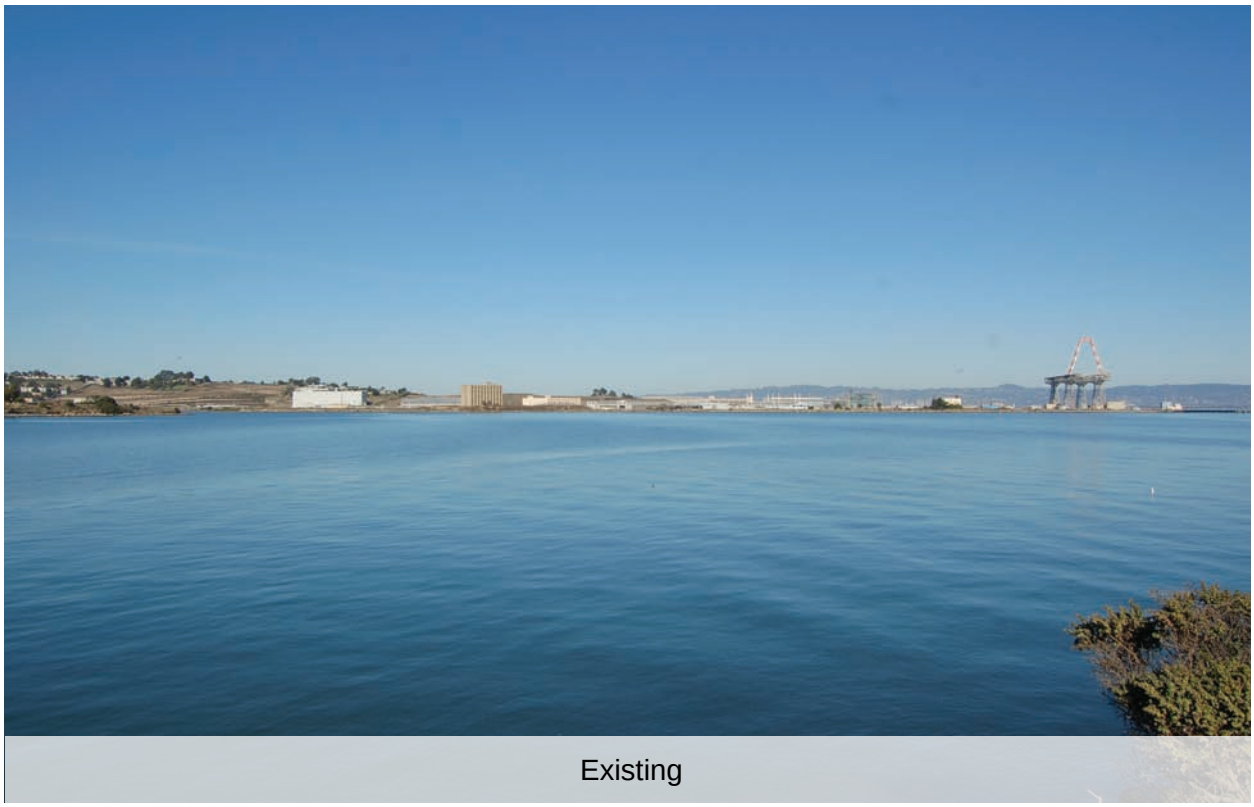
Wind

Maximum building heights would be subject to the same height limitations as the Project. Heights of the R&D and residential structures would be less than the 156-foot height of the stadium structure, and there would be no new structures of 100 feet or greater. The impacts would be less than significant, similar to the Project.

Air Quality

Other than the stadium site and removal of housing units in the Jamestown District on Candlestick Point, land uses provided with the Housing/R&D Variant (Variant 2A) would be the same as the Project. The additional R&D and housing on the stadium site were evaluated considering the 350-foot restriction (buffer) required by the HPS Redevelopment Plan.[1265] The Housing/R&D Variant (Variant 2A) was also evaluated to update the traffic $PM_{2.5}$ and cumulative analyses presented in the technical memoranda prepared by ENVIRON as Appendix H4 (Community Hazards and San Francisco Health Code Article 38 Analyses Candlestick Point–Hunters Point Shipyard Phase II Redevelopment Project, May 2010) and as Appendix T4 ENVIRON, Updated Air Quality Analysis Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3 [Tower Variant D], Alternative 2, and Subalternative 4A, April 26, 2010).

[1265] The HPS Redevelopment Plan states, "No Laboratory, Life Sciences, Light Industrial, and/or Green Technology uses containing a facility that emits regulated toxic air contaminants shall be permitted within 350 feet of any residential use south of Crisp Road in Hunters Point South."



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.11.10 02056 | JCS | 10

FIGURE IV-10b

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING/R&D VARIANT (VARIANT 2A)
VIEW 17: NORTHEAST FROM CPSRA



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.11.10 02056 | JCS | 10

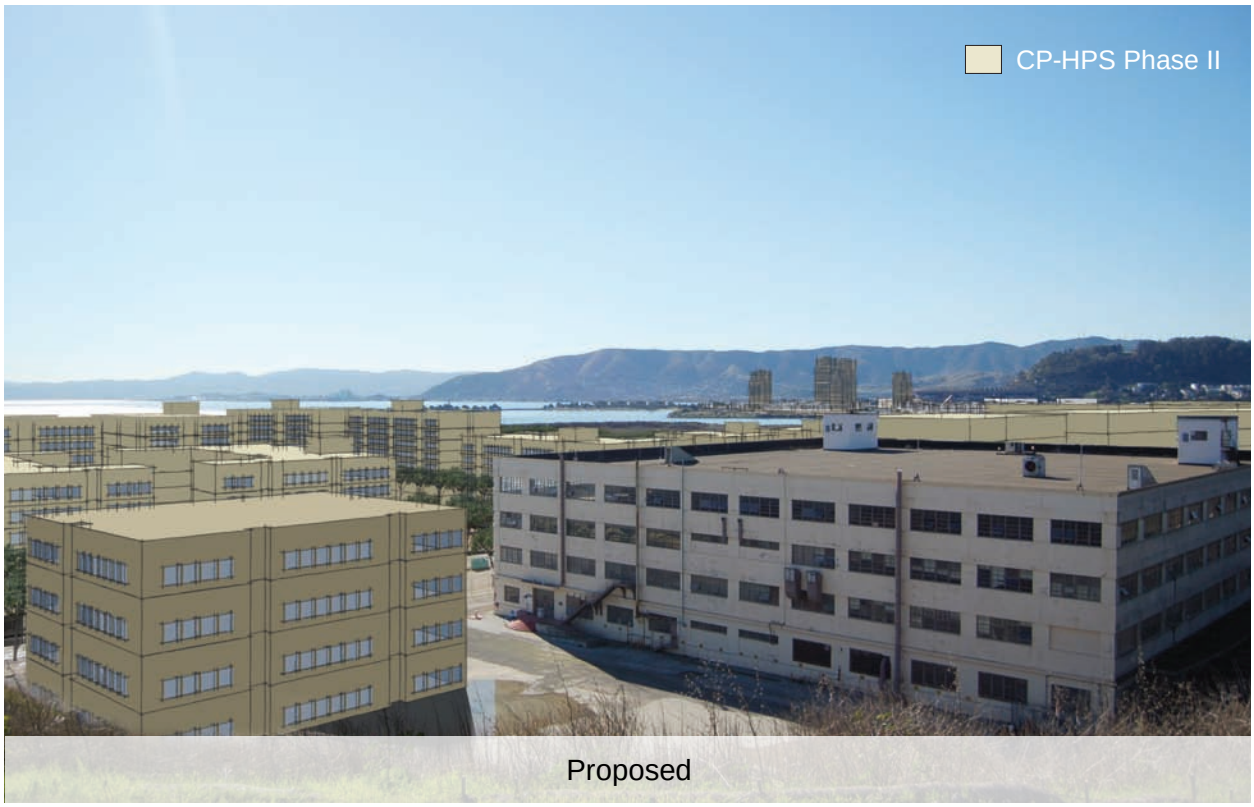
FIGURE IV-10c

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING/R&D VARIANT (VARIANT 2A)
VIEW 18: SOUTH FROM HILLTOP OPEN SPACE



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.11.10 02056 | JCS | 10

FIGURE IV-10d

Candlestick Point — Hunters Point Shipyard Phase II EIR

HOUSING/R&D VARIANT (VARIANT 2A)
VIEW 16a: SOUTHWEST FROM CRISP ROAD

Operational impacts to regional and local air quality would be substantially similar to the Project, less in most respects but slightly greater for PM_{10}. Under the Housing/R&D Variant, the football stadium proposed under the Project would be replaced with 1,625 residential units redistributed from Candlestick Point to HPS Phase II as well as 500,000 sf of R&D. Due to the redistribution of uses under this variant, approximately 672 additional vehicle trips over that of the Project would occur and would result in a somewhat higher level of daily VMT than the Project. As such, the level of certain emissions anticipated under the Housing/R&D Variant (Variant 2A) would be slightly greater than the Project. As shown in Table IV-23a (Housing/R&D Variant [Variant 2A] Operational Criteria Pollutant Emissions [Year 2030]), the difference in daily emissions of RO_X, NO_X, CO, and $PM_{2.5}$ would decrease under this variant compared to the Project by 1 to 6 percent, while PM_{10} emissions would increase by 1.6 percent. Compared to the R&D Variant (Variant 1), because Variant 1 would have substantially greater trips and VMT, the Housing/R&D Variant (Variant 2A) emissions would be less than under the R&D Variant (Variant 1) during operation.

All variants and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. The Housing/R&D Variant (Variant 2A), similar to the Project and the other variants, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. The Housing/R&D Variant's transportation analysis estimates that a similar housing development that did not include the trip reduction features of the Housing/R&D Variant (Variant 2A) would generate 220,323 daily external motor vehicle trips (about 0.6 percent more than the Project, which would generate 219,651 daily trips and 6.8 percent less than the R&D Variant [Variant 1], which would generate 236,291 daily trips). The comparison of the Housing/R&D Variant (Variant 2A) to a similar level of development under "business as usual" conditions shows a 16 to 42 percent reduction in criteria pollutant emissions.

Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land uses anticipated under the Housing/R&D Variant (Variant 2A) would exceed existing BAAQMD thresholds. Under BAAQMD's current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project and the R&D Variant (Variant 1), no additional feasible mitigation measures are available to would reduce the Housing/R&D Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact. It should be noted that, as stated above, although the significance under this variant would be similar to the Project and the R&D Variant (Variant 1), all criteria pollutant emissions, with the exception of PM_{10}, and a slight increase of NO_X associated with the operation of uses under the Housing/R&D Variant (Variant 2A) would be less than the Project, and all criteria pollutant emissions would be less than with the R&D Variant (Variant 1), as stated in Table IV-23a.

With respect to airborne human health risks, emissions associated with operation activities under the Housing/R&D Variant (Variant 2A) would increase the levels of two potential human health risks: (1) TACs and (2) vehicle emissions ($PM_{2.5}$). Under the Housing/R&D Variant, dwelling units would be relocated from CP to the HPS Phase II area.

Table IV-23a Housing/R&D Variant (Variant 2A) Operational Criteria Pollutant Emissions (Year 2030)

Scenario/Emission Source	*ROG (lbs/day)*	*NO_X (lbs/day)*	*CO (lbs/day)*	*PM_{10} (lbs/day)*	*$PM_{2.5}$ (lbs/day)*
Hunters Point Shipyard (Variant 2A)					
Area[a]	261	54	38	0	0
Motor Vehicles (External)	107	96	1,062	508	96
Subtotal	*368*	*150*	*1,100*	*508*	*96*
Candlestick Point (Variant 2A)					
Area[a]	358	58	38	0	0
Motor Vehicles (External)	207	188	2,049	1,006	186
Subtotal	*564*	*246*	*2,087*	1,006	*186*
All Sources (Variant 2A)	***932***	***396***	***3,187***	***1,514***	***282***
All Development Sites (Proposed Project)					
Area[a]	616	108	83	5	5
Motor Vehicles (External)	308	278	3,177	1,466	276
Motor Vehicles (Internal)	30	13	229	45	9
All Sources (Proposed Project)	***945***	***394***	***3,406***	***1,490***	***285***
Comparison to Proposed Project	***99%***	***99.5%***	***94%***	***101.6%***	***99%***
Change from Proposed Project	*-1%*	*0.5%*	*-6%*	*1.6%*	*-1%*
All Sources (R&D Variant)	***997***	***442***	***3,793***	***1,650***	***315***
Comparison to Proposed Project	***106%***	***112%***	***111%***	***111%***	***111%***
Change from Proposed Project	*6%*	*12%*	*11%*	*11%*	*11%*
All Development Sites (Business as Usual)					
Area[a]	616	108	83	5	5
Motor Vehicles	485	476	5,292	2,561	481
All Sources (Business as Usual)	***1,101***	***585***	***5,375***	***2,566***	***486***
Comparison to Proposed Project	***116.5%***	***148%***	***158%***	***172%***	***170.5%***
Comparison to R&D Variant	***110%***	***132%***	***142%***	***155%***	***154%***
Comparison to Variant 2A to Business as Usual	***84%***	***67%***	***59%***	***58%***	***59%***
Reduction from Business as Usual	*-16%*	*-33%*	*-41%*	*-42%*	*-41%*

SOURCE: PBS&J, 2010. Based on URBEMIS 2007 Version 9.2.4; model input/output in included in Appendix H1.

Daily emissions of ROG and NO_X were calculated under Summer conditions when ambient ozone concentrations are highest. Daily emissions of CO, PM_{10}, and $PM_{2.5}$ were calculated under winter conditions when associated ambient concentrations are highest.

* Area emissions are from sources located on the project site, such as natural gas combustion for heating/cooling, maintenance equipment, consumer product use, etc.

The Housing/R&D Variant (Variant 2A) continues to include R&D facilities at HPS Phase II, which are situated partly on the stadium site to the west of the proposed housing on the stadium site and the remainder on a peninsula extending to the east of the proposed additional housing and south of other proposed residential areas. As the predominant winds are out of the west, some on-site receptors would

be downwind from some of these R&D areas, particularly the R&D area on the stadium site. As such, a health risk analysis (HRA) was conducted to determine the potential impacts from a variety of TAC sources in the R&D areas for the Housing/R&D Variant, similar to those discussed for the Project and R&D Variant (Variant 1). Details regarding this assessment can be found in a technical memorandum prepared by ENVIRON on April 26, 2010.[1266]

The HRA estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. The HPS Redevelopment Plan states "no Laboratory, Life Sciences, Light Industrial, and/or Green Technology uses containing a facility that emits regulated toxic air contaminants shall be permitted within 350 feet of any residential use south of Crisp Road in Hunters Point South." Though the Housing/R&D Variant (Variant 2A) has residential areas immediately adjacent to the R&D on the stadium site, with the provision in the HPS Redevelopment Plan, the estimated cancer risks for long-term residential exposure not exceed 10 in one million in the residential areas. The estimated health risks would be above BAAQMD thresholds for all residential receptor locations as a result of implementation of the Variant without the following mitigation measure. Impacts from this Variant would be less than significant with implementation of MM AQ-6.1 and MM AQ-6.2, developed for the Project.

In terms of human health risks associated with vehicle emissions, vehicle trips and thereby vehicle emissions along local roadways would increase with development of the Housing/R&D Variant, similar to the Project. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the Housing/R&D Variant were estimated at selected roadways and compared against the 0.2 $\mu g/m^3$ action level to determine the potential health risks on receptors attributed to vehicle emissions from the Housing/R&D Variant.

Several roadway segments were chosen based on whether Variant-related traffic would use these streets to access neighboring freeways and other areas of *San Francisco* and/or currently or would experience significant truck traffic. The roadways chosen include:

- Third Street
- Innes Avenue/Hunters Point Boulevard/Evans Avenue
- Palou Avenue
- Gilman Avenue/Paul Avenue
- Harney Way
- Jamestown Avenue
- Ingerson Avenue

With the Housing/R&D Variant (Variant 2A), no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of the 0.2 $\mu g/m^3$ action level.[1267] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

[1266] ENVIRON, *Updated Air Quality Analysis Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3 (Tower Variant D), Alternative 2, and Subalternative 4A*, April 26, 2010.
[1267] ENVIRON, *Updated Air Quality Analysis Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3 (Tower Variant D), Alternative 2, and Subalternative 4A*, April 26, 2010.

Overall, the operational emissions generated by the Housing/R&D Variant (Variant 2A) would be bracketed by the amounts generated by the Project and the R&D Variant (Variant 1).

Noise and Vibration

As with the Project, construction activities for the Housing/R&D Variant (Variant 2A) would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels, similar to the Project.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the Housing/R&D Variant, but not to a less-than-significant level, as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a Housing/R&D Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a Housing/R&D Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a Housing/R&D Variant (Variant 2A) would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Noise level increases associated with the Housing/R&D Variant (Variant 2A) are shown in Table IV-24a (Housing/R&D Variant (Variant 2A) Modeled Traffic Noise Levels along Major Project Site Access Roads). Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. However, the Housing/R&D Variant (Variant 2A) would have slightly lower noise levels than the Project along Carroll Avenue and Gilman Avenue but would still be significant, as shown in the table. Measures available to address significant traffic noise increases in these residential areas are limited. As the ultimate feasibility and implementation of the noise insulation measures that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City/Agency as the Lead Agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable, as with the Project.

Table IV-24a	Housing/R&D Variant (Variant 2A) Modeled Traffic Noise Levels along Major Project Site Access Roads							
Roadway	*Land Use*	*Existing Noise Level*	*2030 Without Project*	*2030 With Project*	*2030 With Housing/R&D Variant*	*Variant-Related Increase*	*Allowable Increase*	*Significant Impact?*
Innes north of Carroll Avenue	Residential	53.3	60.9	60.9	60.9	0	2	No
3rd Street south of Carroll Avenue	Residential	62.8	67.3	68.3	67.4	0.1	1	No
Cesar Chavez Boulevard west of 3rd Street	Residential	59	63.5	63.5	63.6	0.1	2	No
Palou Avenue east of 3rd Street	Residential	56.8	61.6	62.1	61.7	0.1	2	No
Ingalls Street north of Carroll Avenue	Residential	56.7	61.7	63.1	62.7	1.0	2	No
Carroll Avenue east of 3rd Street	Commercial	**52.6**	**53.8**	**58.1**	**57.3**	**3.5**	**3**	**Yes**
Gilman Avenue east of 3rd Street	Residential	**57.7**	**60.6**	**64.6**	**63.0**	**2.4**	**2**	**Yes**
Jamestown Avenue north of Harney Way	Residential	51.4	55.5	61.2	59.2	3.7	5	No
Harney Way west of Jamestown Avenue	Residential	52.6	59.0	59.6	59.7	0.7	3	No
Bayshore Boulevard north of Visitacion	Residential	65.1	68.5	68.6	67.9	-0.6	1	No

SOURCE: PBS&J, 2010

Because the Housing/R&D Variant (Variant 2A) would not include a football stadium, noise impacts identified for the Project from football games and concerts would not occur with implementation of the Housing/R&D Variant (Variant 2A).

The Housing/R&D Variant (Variant 2A) site is not located within an airport land use plan area or near a private airstrip. Furthermore, the Housing/R&D Variant (Variant 2A) does not include an aviation component. Therefore, the Housing/R&D Variant (Variant 2A) would not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources and Paleontological Resources

As the Housing/R&D Variant (Variant 2A) would have a smaller footprint than the Project and would develop in the same location, the impact analysis for the Project to cultural and paleontological resources would be applicable to the Housing/R&D Variant (Variant 2A). The same significant and unavoidable impact to historic resources would occur with demolition of Buildings 211, 224, 231, and 253. Mitigation

measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing all other cultural/paleontological resource impacts to less than significant, the same as the Project.

Hazards and Hazardous Materials

As the Housing/R&D Variant (Variant 2A) would have the same types and mix of land uses and slightly less ground disturbance as the Project, the impact analysis for the Project with regard to hazards and hazardous materials would be applicable to the Housing/R&D Variant (Variant 2A). The Housing/R&D Variant (Variant 2A) would not introduce any uses that would handle or transport hazardous materials, other than routine household-type and landscaping chemicals, the risk of which was analyzed in the Draft EIR for the Project. There would be similar amounts of grading and excavation, with similar risks as the Project, of exposure to hazardous materials. The same structures would be demolished during site preparation. The introduction of housing and R&D on the stadium site would not be different from the significance conclusions set forth for the Project. All mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant, the same as for the Project. Therefore, the impact analysis for hazards and hazardous materials for the Housing'/R&D Variant (Variant 2A) would be bracketed by the impact analysis for the Project.

Geology and Soils

As the Housing/R&D Variant (Variant 2A) would have a smaller development footprint than the Project, and would place development in the same locations as the Project, the impact analysis for the Project with regard to geology and soils would apply to the Housing/R&D Variant (Variant 2A). In some areas of the stadium site, slightly different portions would be covered by structures (e.g., west of the stadium footprint); however, there are no geologic conditions in the portion of the stadium site that would be developed under the Housing/R&D Variant (Variant 2A) that would differ from the geologic conditions on the portion of the site where the stadium would be constructed. The potential impact from rock fragmentation at the Jamestown District under the R&D Variant (Variant 1) and Housing Variant (Variant 2) would not occur under the Housing/R&D Variant (Variant 2A). Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant, the same as for the Project. The impacts of the Housing/R&D Variant (Variant 2a) with respect to geology and soils would be bracketed by the analysis for the Project.

Hydrology and Water Quality

The Housing/R&D Variant (Variant 2A) would have slightly less impermeable surface area than the Project, as noted, above. The same type and mix of land uses would be developed under Variant 2A as the Project. Therefore, the impact analysis for the Project with regard to Hydrology and Water Quality would also apply to the Housing/R&D Variant (Variant 2A). Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant, the same as for the Project.

Biological Resources

The Housing/R&D Variant (Variant 2A) would disturb slightly less surface area than the Project, as noted, above. The locations of development are substantially the same as under the Project. Development would

not occur on any portion of the site that has not been previously analyzed, except for a small portion on the south side of Crisp Road that would now contain structures. However, there are no sensitive species or habitat in this location that would be adversely affected by development. Therefore, the impact analysis for the Project with regard to biological resources would apply to the Housing/R&D Variant (Variant 2A). Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant, the same as for the Project.

Public Services

Public Services impacts are based on adequacy of service provided to the population. The Housing/R&D Variant (Variant 2A) would result in the same number of residents as the Project, as the number of dwelling units would be the same. The Housing/R&D Variant (Variant 2A) would generate 11,629 jobs, less than the 16,635 jobs estimated for the R&D Variant. Therefore, the impacts on Public Services analyzed for the R&D Variant (Variant 1) would also apply to the Housing/R&D Variant (Variant 2A), as the population and employment generated are within the maximums previously analyzed under the R&D Variant (Variant 1). The impacts would be less than significant, bracketed within the analysis for the Project and the R&D Variant (Variant 1). Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant.

Recreation

The Housing/R&D Variant (Variant 2A) would provide 326.6 acres of parkland, which is 9.8 acres less than the Project. The conceptual development plan for this Variant would result in the development of residential units and parks during all stages of development. Table IV-26a (Housing/R&D Variant [Variant 2A] Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the Housing/R&D Variant). As this table indicates, the park-to-population ratio would not drop below 13.3 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population.

Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant, the same as for the Project.

Table IV-26a Housing/R&D Variant (Variant 2A) Residential Units and Park Acreage Provided during Each Stage of Development

Stage of Development	*Residential Units*	*Population*	*Total Parkland (ac)*	*Park-to-Population Ratio (acres per 1,000 Residents)*
Existing	256	1,113[a]	120.2	108
Phase 1	3,160	7,363[b]	136.0	18.5
Phase 2	4,410	10,275[b]	162.5	15.8
Phase 3	7,785	18,139[b]	246.7	13.6
Phase 4	10,500	24,465[b]	326.6	13.3

SOURCE: Lennar Urban, 2010.

a. Refer to Table III.C-1 (Existing Population [2005]) in Section III.C (Population, Employment, and Housing). This population correlates to the total number of households in the Traffic Analysis Zone, which includes more than the 256 households located in the Candlestick portion of the Project site (e.g., 292). It is likely, therefore, that the population within the Candlestick portion of the Project site is less than 1,113, which would only increase the existing park-to-population ratio.

b. Calculated as 2.33 people per residential unit.

Utilities

A supplemental Water Demand Memo (refer to Appendix Q2 [Arup, Amendment to Water Demand Memorandum #16—Variant 2A (Housing/R&D Variant), April 28, 2010]) was prepared to calculate the water demand for the Housing/R&D Variant (Variant 2A). As shown in Table IV-27a (Housing/R&D Variant [Variant 2A] Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance [mgd]), total demand for potable water would be 1.73 mgd, which is less than the 1.99 mgd calculated for the R&D Variant (Variant 1). Calculating wastewater generation based on land use (residential, football stadium, and performance venue calculated at 95 percent of water demand; all other land uses calculated at 57 percent of water demand), the total wastewater generated by the Housing/R&D Variant (Variant 2A) would be 1.23 mgd (refer to Table IV-28a [Housing/R&D Variant [Variant 2A] Wastewater Generation]), which is less than the 1.35 mgd calculated for the R&D Variant (Variant 1). Mitigation measures identified for the Project and the R&D Variant (Variant 1) would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant.

With regard to solid waste generation, Table IV-30a (Housing/R&D Variant (Variant 2A) Solid Waste Generation) shows that the total amount of solid waste that would result from implementation of the Housing/R&D Variant (Variant 2A) would be 20,036 tons per year, 2,189 tons less than under the R&D Variant (Variant 1), which would generate 22,225 tons (refer to Table IV-14 [R&D Variant Solid Waste Generation] on page IV-62 of the EIR). Therefore, the analysis of solid waste for the Housing/R&D Variant (Variant 2A) would be bracketed by the analysis for the R&D Variant (Variant 1). Similar to the R&D Variant (Variant 1), solid waste generated by the Housing/R&D Variant (Variant 2A) could be accommodated by the remaining landfill capacity with implementation of the strategies for diversion of waste as described in Section III.Q (Utilities) of the EIR. Mitigation measures identified for the Project and the R&D Variant (Variant 1) would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant.

Table IV-27a Housing/R&D Variant (Variant 2A) Water Demands Adjusted for Plumbing Codes and SF Green Building Ordinance (mgd)

Land Use	*Candlestick Point*	*Hunters Bay Shipyard*	*Total*
Residential	0.48	0.35	0.83[a]
Hotel	0.05	0.00	0.05
Office	0.04	0.00	0.04
Artists Studios	0.00	0.01	0.01
R&D	0.00	0.43	0.43
Neighborhood Retail	0.02	0.02	0.03[a]
Regional Retail	0.08	0.00	0.08
Community Uses	0.01	0.01	0.02
Football Stadium	0.00	0.00	0.00
Performance Venue	0.01	0.00	0.01
Subtotal	*0.70[a]*	*0.82[a]*	*1.52[a]*
Parks and Open Space	0.06	0.15	0.22
Total Demand	***0.76[a]***	***0.97[a]***	***1.73***

SOURCE: Arup, Candlestick Point–Hunters Point Shipyard Phase II Water Demand Memorandum, April 2010.

a. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals used in this table. These entries are correct and are consistent with Table 13 of the Water Demand Memorandum.

Table IV-28a Housing/R&D Variant (Variant 2A) Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as % of Water Demand (or as otherwise specified)*	*Candlestick Point (mgd)*	*Hunters Point (mgd)*	*Total Housing Variant (mgd)*
Residential	95%	0.46	0.33	0.79
Hotel	95%	0.03	0.00	0.03
Office	57%	0.02	0.00	0.02
Artists Studios	57%	0.00	0.01	0.01
R&D	57%	0.00	0.25	0.25
Neighborhood Retail	57%	0.01	0.01	0.02
Regional Retail	57%	0.05	0.00	0.08
Community Uses	57%	0.01	0.01	0.02
Football Stadium	95%	0.00	0.00	0.00
Performance Venue	95%	0.01	0.00	0.01
Total		***0.59***	***0.61***	***1.23***

SOURCE: Arup, March 31, 2010.

Table IV-30a Housing/R&D Variant (Variant 2A) Solid Waste Generation

		Candlestick Point			*HPS Phase II*			*Total*		
Use	*Generation Factor (per day)*	*Area or Units*	*Tons per Day or Event*	*Tons per Year*	*Area or Units*	*Tons per Day or Event*	*Tons per Year*	*Area or Units*	*Tons per Day or Event*	*Tons per Year or per Total Number of Events*[a]
Residential	5.653 lbs/unit	6,225	17.6	6,422	4,275	12.1	4,410	10,500	29.7	10,832
Retail	0.02600411 lbs/sf	760,000 sf	9.9	3,613.5	125,000 sf	1.6	584.0	885,000 sf	11.5	4,197.5
Office	0.006 lbs/sf	150,000 sf	0.5	182.5	0	0	0	150,000 sf	0.5	182.5
Hotel	0.0108 lbs/sf	150,000 sf	0.8	292.0	0	0	0	150,000 sf	0.8	292.0
R&D	0.006 lbs/sf	0	0	0	3,000,000 sf	9	3,285	3,000,000 sf	9	3,285
Performance Venue	2.23 lbs/seat	10,000 seats	5.6[b]	836.3[c]	0	0	0	10,000 seats	5.6	836.3[c]
Stadium	2.23 lbs/seat	0	0	0	0	0	0	0	0	0
Artist Studios/Art Center	0.006 lbs/sf	0	0	0	255,000 sf	0.8	292	255,000 sf	0.8	292.0
Community Facilities	0.006 lbs/sf	50,000 sf	0.15	54.8	50,000 sf	0.15	54.8	100,000 sf	0.3	109.6
Total				***13,082***			***6,954***			***20,036***

SOURCE: PBS&J 2010; Generation Factors from Arup, *Carbon Footprint Report*, March 24, 2009.

a. Calculated by adding the horizontal columns, rather than calculating total number of units by the generation rate.

b. The Performance venue is projected to be 50 percent attendance.

c. Assumes 150 events per year at 50 percent attendance.

Energy

As shown below in Table IV-31a (Housing/R&D Variant [Variant 2A] Electricity Demand from Building Envelopes [MWh]), the Housing/R&D Variant (Variant 2A) would be expected to result in an electricity demand of approximately 33,105 Megawatt hours (MWh). This represents a 21 percent decrease in electrical consumption compared to the R&D Variant (Variant 1). Therefore, as the electricity demand for Variant 2A would be less than what has been analyzed for Variant 1, the impacts have been bracketed by the analysis for the R&D Variant (Variant 1) and would be similarly less than significant. Mitigation measures identified for the Project would be implemented for the Housing/R&D Variant (Variant 2A), reducing the impacts to less than significant.

Greenhouse Gas Emissions

A greenhouse gas emissions analysis was conducted for the Housing/R&D Variant (Variant 2A) and the analysis is provided in Appendix T5 (ENVIRON, Updated Greenhouse Gas Emissions Calculation for Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Variants 2A and 3 [Tower Variant D], Alternative 2, and Subalternative 4A, March 12, 2010).

Operational impacts to climate change and GHG emissions would be substantially similar to the Project. Under the Housing/R&D Variant (Variant 2A), as shown in Appendix T5, the operational GHG emissions for the Housing/R&D Variant (Variant 2A) would be higher than the Project GHG emissions by 7,013 tonnes of CO_2e per year. As noted in Table IV-17 on page IV-69 of the Draft EIR, the R&D Variant (Variant 1) would emit 178,651 tonnes of CO_2e per year, 14,488 tonnes more than the Housing/R&D Variant (Variant 2A). All mitigation measures and improvements in electricity carbon intensity and energy efficiency of the buildings under the Project and the R&D Variant (Variant 1) would be implemented with the Housing/R&D Variant (Variant 2A). This would result in substantially similar reductions of GHG emissions as the Project and, like the Project and the R&D Variant (Variant 1), the Housing/R&D Variant (Variant 2A) would make a less-than-significant contribution to the cumulative impacts of climate change and GHG emissions. For the same reasons as stated for the Project, the Housing/R&D Variant (Variant 2A) would not impede the achievement of San Francisco's GHG emission reduction ordinance nor the statewide emission reductions required under AB 32, which is also called the *California Global Warming Solutions Act of 2006*.

BAAQMD Draft GHG Thresholds

With mitigation, the Housing/R&D Variant-related operational emissions of 161,596 tonnes per year result in 4.6 tonnes CO_2e per service population per year based on a service population of 35,498 (this accounts for 23,869 net new residents [based on 2.33 residents per household and accounting for existing units on site] and all 11,629 jobs). The operational emissions of the Project were identified as totaling 4.5 tonnes CO_2e per year, and emissions of the Housing Variant (Variant 2) were identified as totaling 4.6 tonnes CO_2e per year. As the Housing/R&D Variant (Variant 2A) would result in a substantially similar amount of CO_2e per year as the Project and the Housing Variant (Variant 2), previously analyzed, like the Project and the Housing Variant (Variant 2), the Housing/R&D Variant (Variant 2A) would result in a less-than-significant impact on climate change.

Table IV-31a Housing/R&D Variant (Variant 2A) Electricity Demand from Building Envelopes (MWh)

		Candlestick Point			HPS Phase II			Project Site Total			
Type of Use	*Electricity Use Factor, 2008 Title 24 Standards (MWh/gsf or unit)*[a]	*Development Program*[b]	*MWh Consumed Annually, 2008 Title 24 Standards*[c]	*MWh Consumed Annually, with 15% Reduction*	*Development Program*[b]	*MWh Consumed Annually, Title 24 Standards*[c]	*MWh Consumed Annually, with 15% Reduction*	*Development Program*	*MWh Consumed Annually, Title 24 Standards*	*MWh Consumed Annually, with 15% Reduction*	*Percent of Total Electricity by Land Use*
Residential Units	1.7350[d]	6,225	10,800	9,180	4,275	7,417	6,304	10,500	18,218	15,485	47%
Retail	0.0027	635,000	1,715	1,457	—	0	0	635,000	1,715	1,457	4%
Neighborhood Retail	0.0027	125,000	338	287	125,000	338	287	250,000	675	574	2%
Office	0.0052	150,000	780	663	—	0	0	150,000	780	663	2%
R&D	0.0052	—	0	0	3,000,000	15,600	13,260	3,000,000	15,600	13,260	40%
Hotel	0.0027	220	1	1	—	0	0	220	1	1	0%
Artist Studios/ Center	0.0052	—	0	0	255,000	1,326	1,127	255,000	1,326	1,127	3%
Community Space	0.0052	50,000	260	221	50,000	260	221	100,000	520	442	1%
Arena	0.0015	75,000	113	96	—	0	0	75,000	113	96	0.3%
Total			***14,007***	***11,905***		***24,941***	***21,200***		***38,948***	***33,105***	***100%***

SOURCES:

Housing/R&D Variant (Variant 2A) electricity demand was estimated based on the Applicant's commitment to achieve 15 percent energy reductions below Title 24 standards and use ENERGY STAR appliances in all residential units.

a. The energy use factor cited for residential units is from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-8 (Appendix S to this EIR). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15 percent Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. Based on buildout floor areas provided in Table IV-3 of this EIR.

c. Calculated by multiplying energy use factor by number of units or gsf.

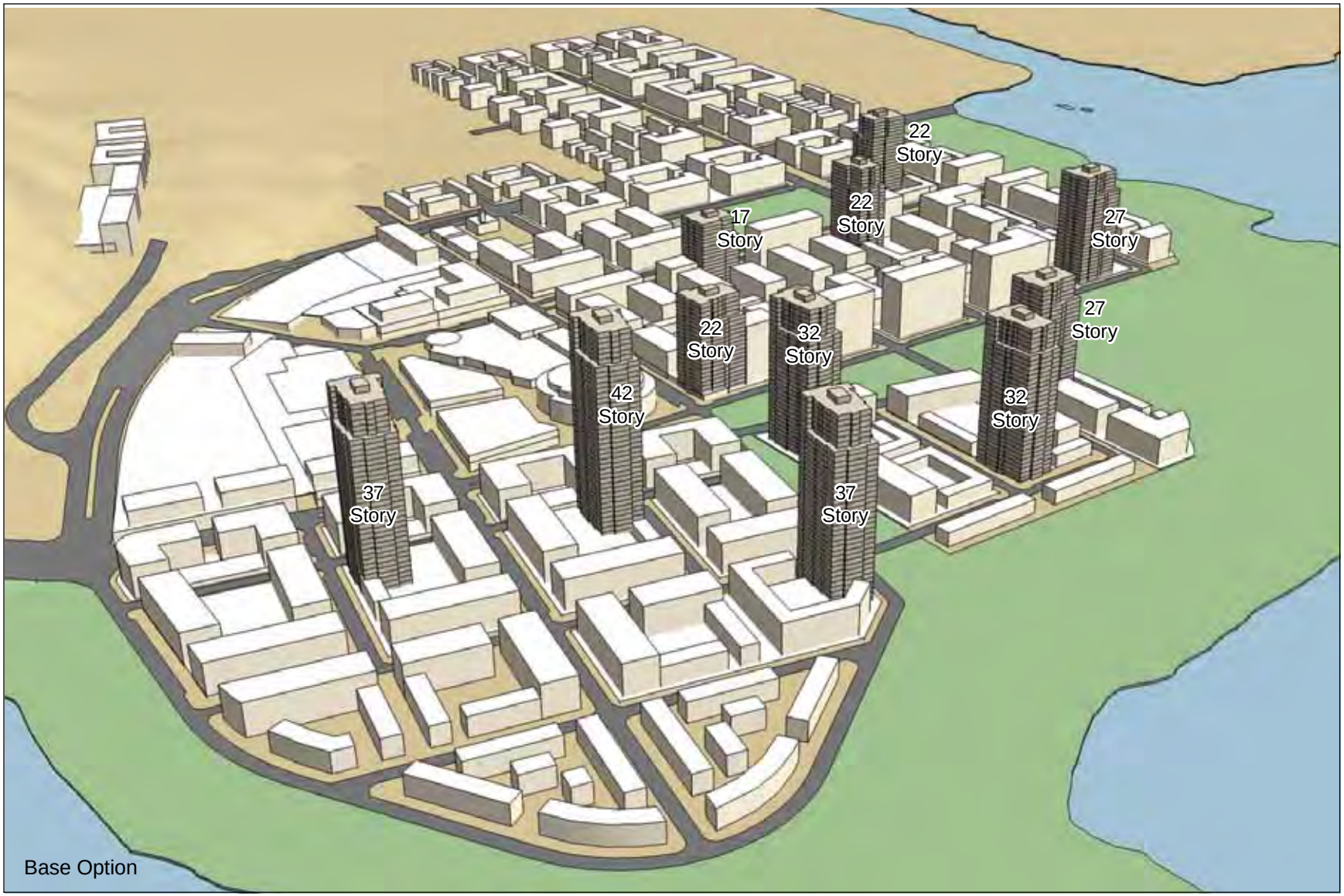
d. The electricity factors cited for non-residential uses are from: ENVIRON International Corporation, *Climate Change Technical Report: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, October 2009, Table 3-16 (Appendix S to this EIR). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

e. Numbers are rounded according to standard rounding practices and may not add up due to hidden decimals.

IV.D VARIANT 3: CANDLESTICK POINT TOWER VARIANTS

IV.D.1 Overview

- The Candlestick Point Tower Variants (Tower Variants) would have different locations and heights and bulk of residential towers at Candlestick Point. The four Candlestick Point Tower Variants (Tower Variants A, B, C, and D) would have the same overall land use program as the Project. While there would be different tower locations and heights with these variants, the total number of residential units, 10,500, would remain the same as the Project. Figure IV-13 (Project Towers at Candlestick Point) illustrates a perspective view of the 11 towers proposed at Candlestick Point with the Project to provide a comparison to the Tower Variants. The Tower Variants include the following:
  - **Tower Variant A** would add ten stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower, as shown in Figure IV-14 (Tower Variant A). Three other residential towers at Candlestick Point South would have three to four fewer floors in order to maintain the overall residential floor area of the Project with this Variant. The variant would have 11 towers at Candlestick Point, as with the Project.
  - **Tower Variant B** would have an additional 24-story residential tower at Candlestick Point Center. One 17-story tower at Candlestick Point North would be removed as shown in Figure IV-15 (Tower Variant B). Three other towers at Candlestick Point South would have would have two to four fewer floors in order to maintain the overall residential floor area of the Project with this Variant. The variant would have 11 towers at Candlestick Point, as with the Project.
  - **Tower Variant C** would have an additional 24-story residential tower at Candlestick Point Center, as with Tower Variant B, as shown in Figure IV-16 (Tower Variant C). The variant would also add ten stories to one of the 22-story residential towers at Candlestick Point North, as with Tower Variant A, resulting in a 32-story residential tower. To maintain the overall residential floor area of the Project with this Variant, one 17-story tower and one 22-story at Candlestick Point North would be removed and at Candlestick Point South, one tower would have two fewer floors and one would have six fewer floors. The variant would have 10 towers at Candlestick Point, compared to 11 towers with the Project.
- - **Tower Variant D** would reduce a 37-story tower to 31 stories within Candlestick Point South; one 27-story residential tower at Candlestick Point South would be lowered to 24 stories, or three fewer floors; and one 32-story tower would be relocated from Candlestick Point South to Candlestick Point North. This Variant would add 10 stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower; one 22-story tower and one 17-story tower would be relocated within Candlestick Point North; and one residential tower at Candlestick Point North would be lowered to 24 stories, or three fewer floors. This Variant would have an additional 24-story residential tower at Candlestick Point Center. This Variant would have 12 towers at Candlestick Point, compared to 11 towers with the Project. The floor plate area of the residential towers would be increased to 12,500 sf compared to the 10,000 sf analyzed for the Project, which would result in slightly greater tower bulk. However, the larger floor plates would be accommodated on the existing podium design and, therefore, the building footprint would not increase.
- As shown in Figure IV-13 through Figure IV-16a (Tower Variant D), the Tower Variants' overall street and block plan would be same as that of the Project. All other features of the Tower Variants would also be the same as the Project.



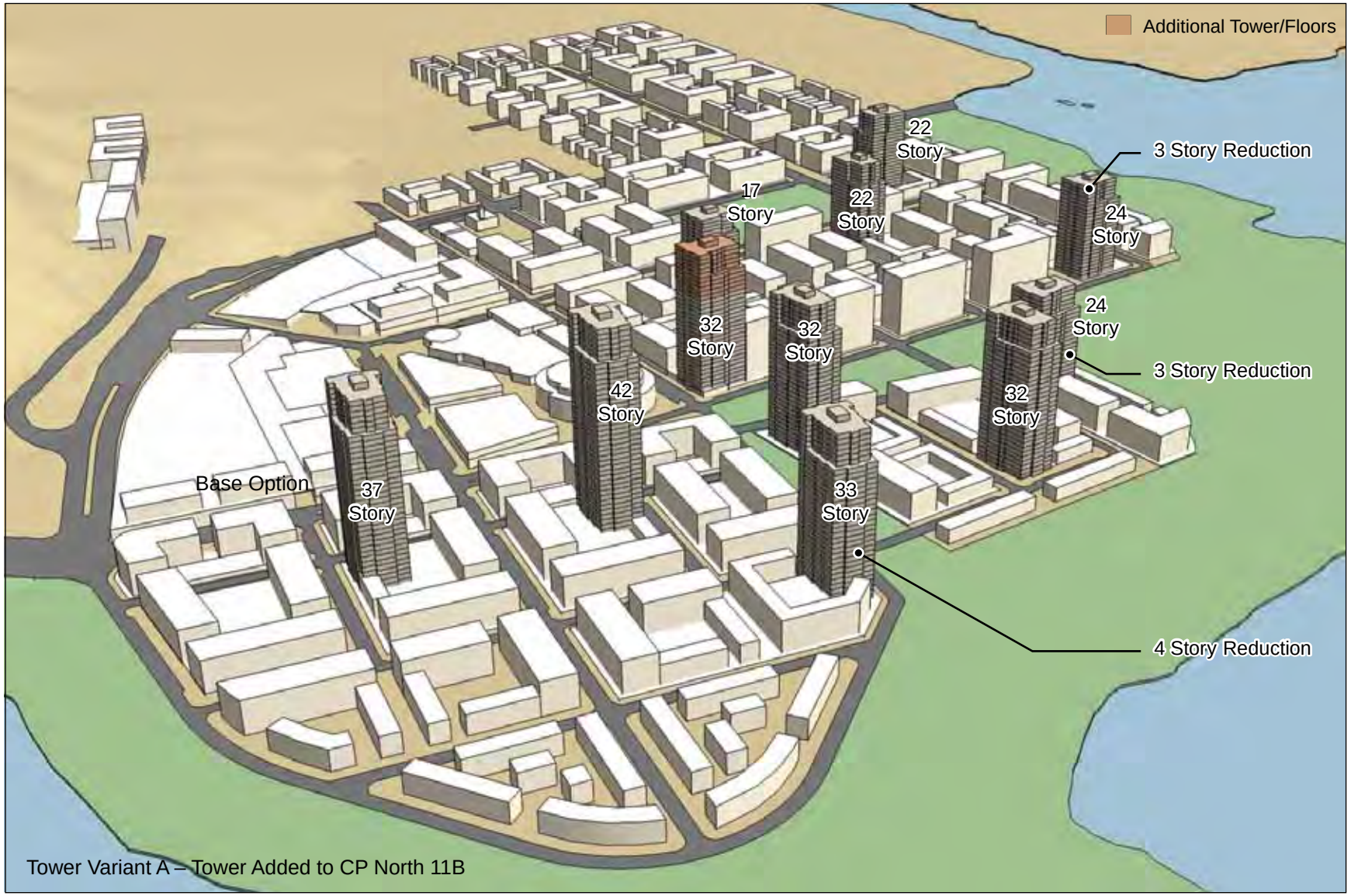
SOURCE: Lennar Urban, IBI Group, 2009.

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FIGURE IV-13

Candlestick Point — Hunters Point Shipyard Phase II EIR

PROJECT TOWERS AT CANDLESTICK POINT



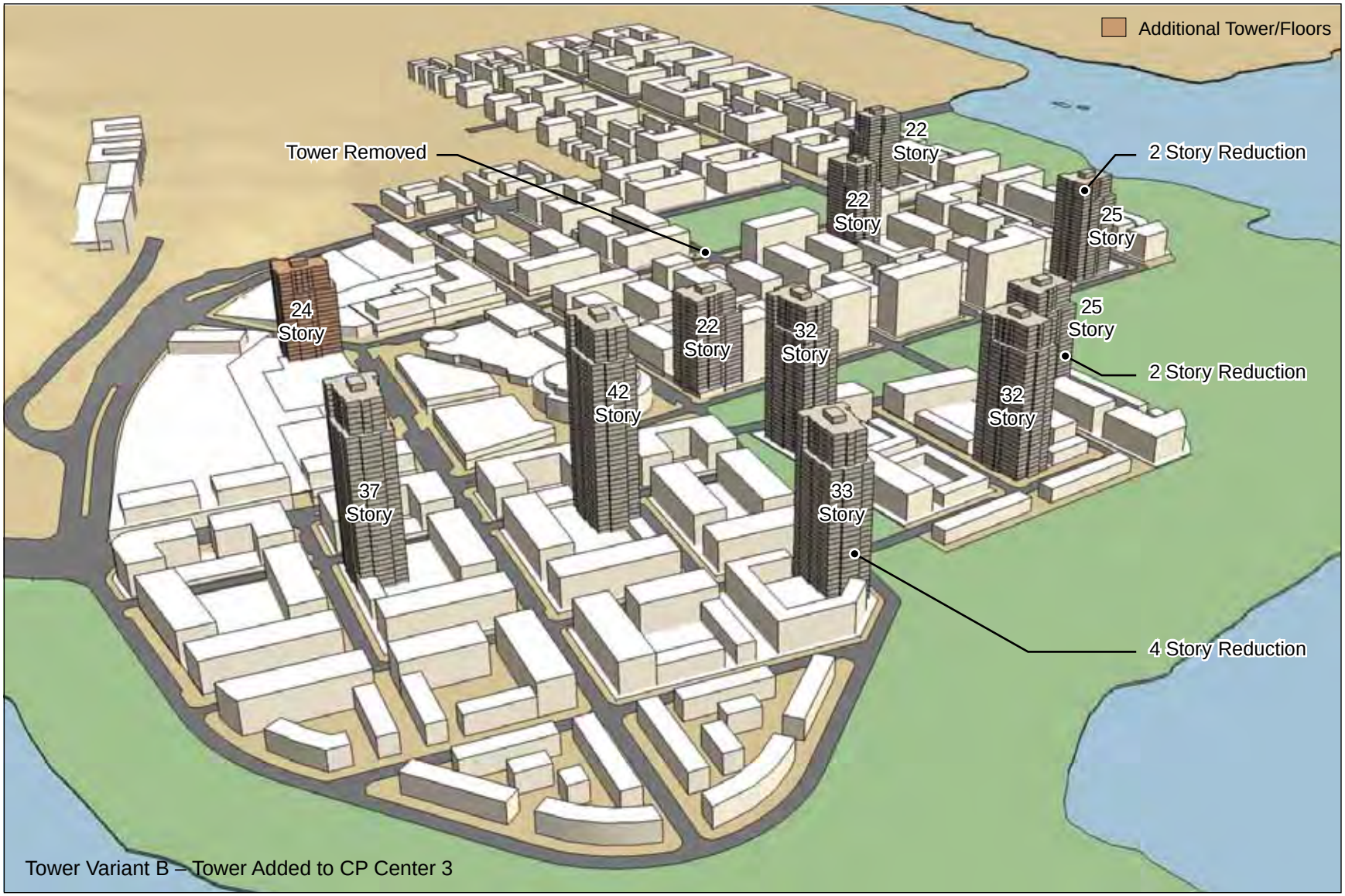
SOURCE: Lennar Urban, IBI Group, 2009.

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FIGURE IV-14

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT A



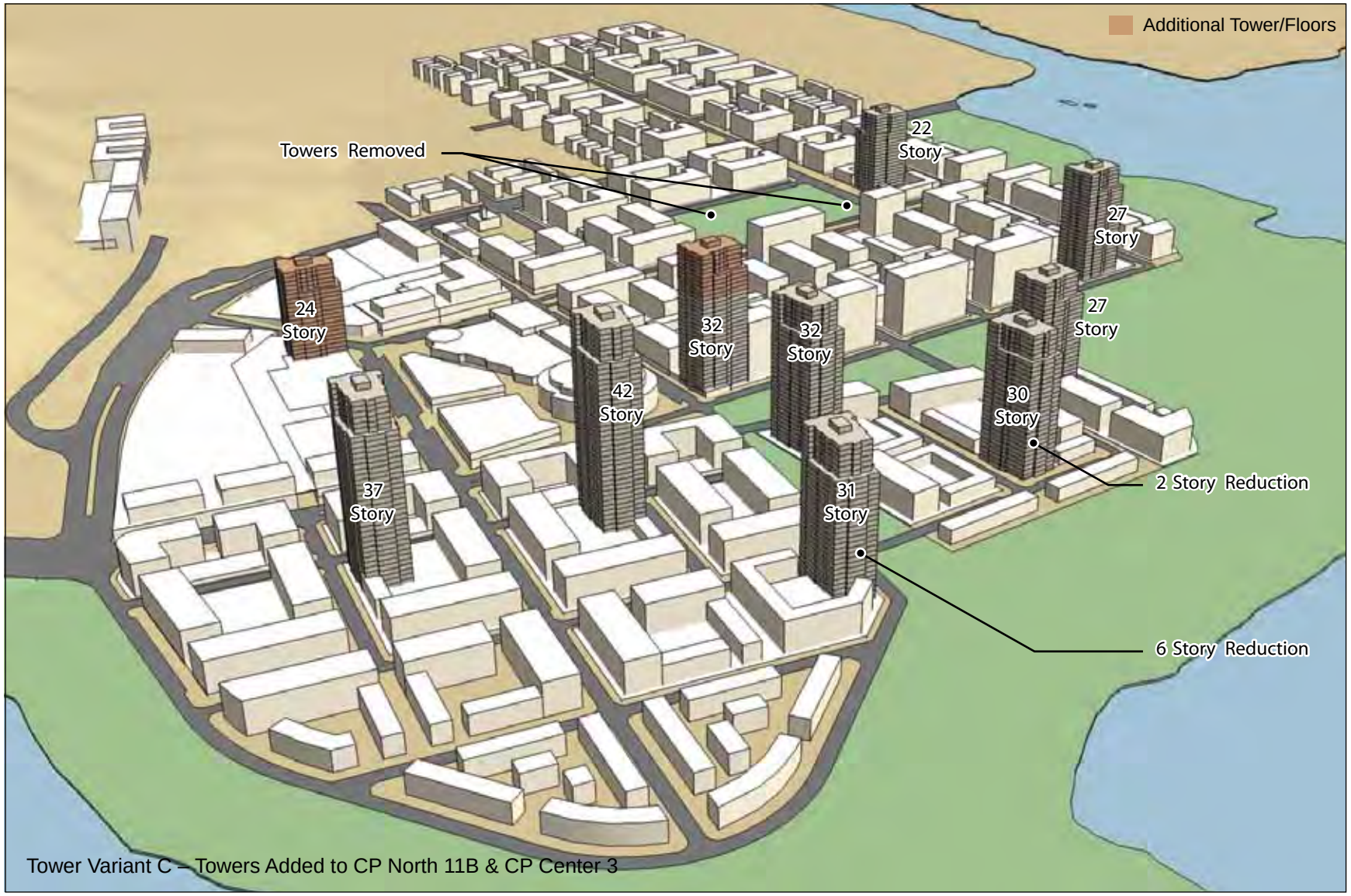
SOURCE: Lennar Urban, IBI Group, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT B

FIGURE IV-15



SOURCE: Lennar Urban, IBI Group, 2009.

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FIGURE IV-16

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT C



SOURCE: Lennar Urban, IBI Group, 2010.

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FIGURE IV-16a

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D

IV.D.2 Project Objectives

The objectives for the Tower Variants would be the same as for the Project. A full list of Project objectives is provided in Section II.D of this EIR.

IV.D.3 Characteristics

Section II.E outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. While each of these components of the Project would also apply to this variant, Figure II-5 (Proposed Maximum Building Heights) in Chapter II would be different for this variant.

Tower Variant A

Tower Variant A would add ten stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower. Three other residential towers at Candlestick Point South would have three to four fewer floors in order to maintain the overall residential floor area of the Project with this Variant. The variant would have 11 towers at Candlestick Point, as with the Project.

All other features of Tower Variant A would be the same as the Project, with the same land uses, the same total amount of development, and the same development footprint.

Tower Variant B

Tower Variant B would have an additional 24-story residential tower at Candlestick Point Center. One 17-story tower at Candlestick Point North would be removed. Three other towers at Candlestick Point South would have would have two to four fewer floors in order to maintain the overall residential floor area of the Project with this Variant. The variant would have 11 towers at Candlestick Point, as with the Project. All other features of Tower Variant A would be the same as the Project, with the same land uses, the same total amount of development, and the same development footprint

Tower Variant C

Tower Variant C would have an additional 24-story residential tower at Candlestick Point Center, as with Tower Variant B. The variant would also add ten stories to one of the 22-story residential towers at Candlestick Point North, as with Tower Variant A, resulting in a 32-story residential tower. To maintain the overall residential floor area of the Project with this Variant, one 17-story tower and one 22-story at Candlestick Point North would be removed and at Candlestick Point South, one tower would have two fewer floors and one would have six fewer floors. The variant would have 10 towers at Candlestick Point, compared to 11 towers with the Project. All other features of Tower Variant C would be the same as the Project, with the same land uses, the same total amount of development, and the same development footprint.

Tower Variant D

Tower Variant D is based on height, bulk and massing requirements for vertical development within the Project site as described in the Design For Development. The Design For Development identifies specific

locations for certain towers and allows towers in certain "tower zones." Where the Design For Development allows placement of towers within a "tower zone," the Tower Variant D analysis assumes a specific tower location within proposed tower zones, which in some instances could potentially increase new shading on existing open space owned by or under the jurisdiction of the San Francisco Recreation and Park Department (SFRPD). Figure C&R-1 (Tower Variant D Tower Zones Map) indicates where the Design For Development identifies tower zones and the assumed location of towers within those zones for purposes of the Tower Variant D analysis.

Tower Variant D would reduce one 37-story tower to 31 stories, or six fewer floors, in Candlestick Point South; one 27-story residential tower at Candlestick Point South would be lowered to 24 stories, or three fewer floors; and one 32-story tower would be relocated from Candlestick Point South to Candlestick Point North. This Variant would add 10 stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower, as with Tower Variants A and C; one 22-story tower and one 17-story tower would be relocated within Candlestick Point North; one residential tower at Candlestick Point North and one residential tower at Candlestick Point South would be lowered to 24 stories, or three fewer floors, as with Tower Variant A. This Variant would have an additional 24-story residential tower at Candlestick Point Center, as with Tower Variants B and C. This Variant would have 12 towers at Candlestick Point, compared to 11 towers with the Project.

The residential tower floor sizes with Tower Variant D would be a maximum of 12,500 square feet, compared to 10,500-square-foot maximum floor sizes with the Project. All other features of Tower Variant D would be the same as the Project, with the same land uses, the same total amount of development, and the same development footprint. With Tower Variant D, the two residential towers at HPS Phase II proposed with the Project would also have floor sizes with a maximum of 12,500 square feet, compared to 10,500-square-foot maximum floor sizes with the Project.

IV.D.4 Potential Environmental Effects

Overall, the Tower Variants would not change the total amount of development compared to the Project, but the Tower Variants would change the location or height of residential towers, as described above.

Thus, changes in environmental effects of the Tower Variants, compared to the Project, would result from the location or height of residential towers. As the total amount of development and the development footprint would be the same as the Project, most of the construction-related and operational environmental effects of the Tower Variants would be the same as the Project, as discussed below. For most environmental topics, the effects of all three Tower Variants would be the same, except where noted below.

Land Use and Plans

As the total amount of development and the development footprint would be the same as the Project, development of a Tower Variant would not physically divide an established community or conflict with plans, policies, or regulations adopted to avoid or mitigate an environmental effect. Operation of a Tower Variant would alter the existing character of the vicinity, but the modified heights, number, and location of residential towers would be consistent with uses and building characteristics proposed with the Project. Therefore, the additional structures, change in location of some structures, and the increase in height of

some structures would not result in an adverse change to the character of the site or the surrounding areas and each Tower Variant would result in a less-than-significant impact, similar to the Project.

Population, Housing, and Employment

As discussed above, a Tower Variant would include the same development proposed with the Project, including equivalent amounts of residential, commercial, and other land uses. Thus short-term employment opportunities during the construction period would be similar to the Project. Development and occupancy of a Tower Variant would result in the same population changes as with the Project. While operation of a Tower Variant could induce population growth directly and/or indirectly, this growth would not be substantial and a Tower Variant would result in a less-than-significant impact, similar to the Project. As with the Project, a Tower Variant would not displace existing housing units or residents at Candlestick Point (as replacement housing would be provided prior to removal of any existing units), and construction of replacement housing would not be necessitated elsewhere. Thus, potential population, employment, and housing impacts of a Tower Variant would be less than significant, similar to the Project.

Transportation and Circulation

As the footprint of development, the total amount of development, and the land uses provided under a Tower Variant would be similar to the Project, traffic impacts for a Tower Variant would also be similar to the Project. While there would be additional towers under the Tower Variant, the total number of residential units would remain the same as the Project. Transportation impacts associated with the Tower Variant would be the same as those identified for the Project. The impacts identified would be the same and the mitigation measures would be the same, as those identified for the Project.

Although the Tower variant would increase the local traffic in the blocks where density increases, the Tower Variant would not result in an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system, and would be the same as analyzed for the Project. A Tower Variant would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management plan (CMP) for roads or highways.

The Tower Variant site is not located within the San Francisco Airport Land Use Policy Plan Area or other airport land use plan, and a Tower Variant would not result in a safety hazard from airport operations for people residing or working in the area. The Tower Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Therefore, the Tower Variants would result in a less than significant impact to aircraft activity and traffic levels, similar to the Project.

Development under a Tower Variant would not affect or increase hazards due to design features or incompatible uses aboveground. The new buildings would be designed consistent with the SFBC, which would reduce all potential design hazards to a less than significant level. The roadway network associated with a Tower Variant would be designed to meet all applicable codes, including design guidelines for emergency access, and would result in a less than significant impact associated with design hazards. As the same amount of development would result from a Tower Variant as the Project, and since the same design standards would apply for both, potential traffic impacts from design hazards would be similar to the Project.

Thus substantial additional parking, above that provided by the Project, would not be required, and impacts would be less than significant. As the same amount of development and the same land uses would occur under a Tower Variant as with the Project, parking impacts would be similar to the Project.

The Tower Variants would comply with adopted policies and plans regarding alternative transportation, and impacts would be less than significant, similar to the Project.

Aesthetics

Changes in effects on aesthetics and visual resources with the Tower Variants, compared to the Project, would result from the location or height of residential towers. A Tower Variant would include up to 11 towers, as with the Project, change the location of one or two towers, increase height of some towers and reduce the height of others, as described above under Characteristics.

Construction activities associated with a Tower Variant would not have a substantial adverse effect on a scenic vista or scenic resources, similar to the Project. Construction activities associated with a Tower Variant could result in temporary degradation of the visual character or quality of the site. With the implementation of mitigation measure MM AE-2 (Mitigation for Visual Character/Quality Impacts During Construction) to screen construction sites from public view and provide for appropriate staging and cleaning of construction equipment, impacts would be reduced to a less-than-significant level, similar to the Project. Construction activities associated with a Tower Variant would not create a new source of substantial light or glare that would adversely affect day or night views in the area, or that would substantially impact other people or properties, and impacts would be less than significant, similar to the Project.

The pattern and scale of buildings at Candlestick Point with the Tower Variants would be similar to the Project. All Tower Variants would have 10 or 12 towers, compared to 11 towers with the Project. As shown in Figure IV-14 to Figure IV-16a, the Tower Variants would include at least six of the 11 residential towers proposed with the Project in the identical location, with differences in the number floors of four of the towers (Tower Variant A); or would relocate a tower from Candlestick Point North to Candlestick Point Center and reduce the number floors of three other towers (Tower Variant B); or relocate a tower from Candlestick Point North to Candlestick Point Center, remove another tower from Candlestick Point North and reduce the number floors of two other towers, and add 10 floors at one tower (Tower Variant C and D); Tower Variant D would relocate a 37-story tower and reduce total floors to 31 stories within Candlestick Point South; one 32-story tower would be relocated from Candlestick Point South to Candlestick Point North; one 22-story tower and one 17-story tower would be relocated within Candlestick Point North; and one additional 24-story residential tower would be added at Candlestick Point Center. Tower Variant D would have 12 towers at Candlestick Point, compared to 11 towers with the Project.

Tower Variant D would have maximum floor sizes of 12,500 square feet, compared to 10,500 square foot maximum floor sizes with the Project. Tower Variant D dimensions and visibility would be slightly greater than with the Project; overall visual effects would be similar to the Project.

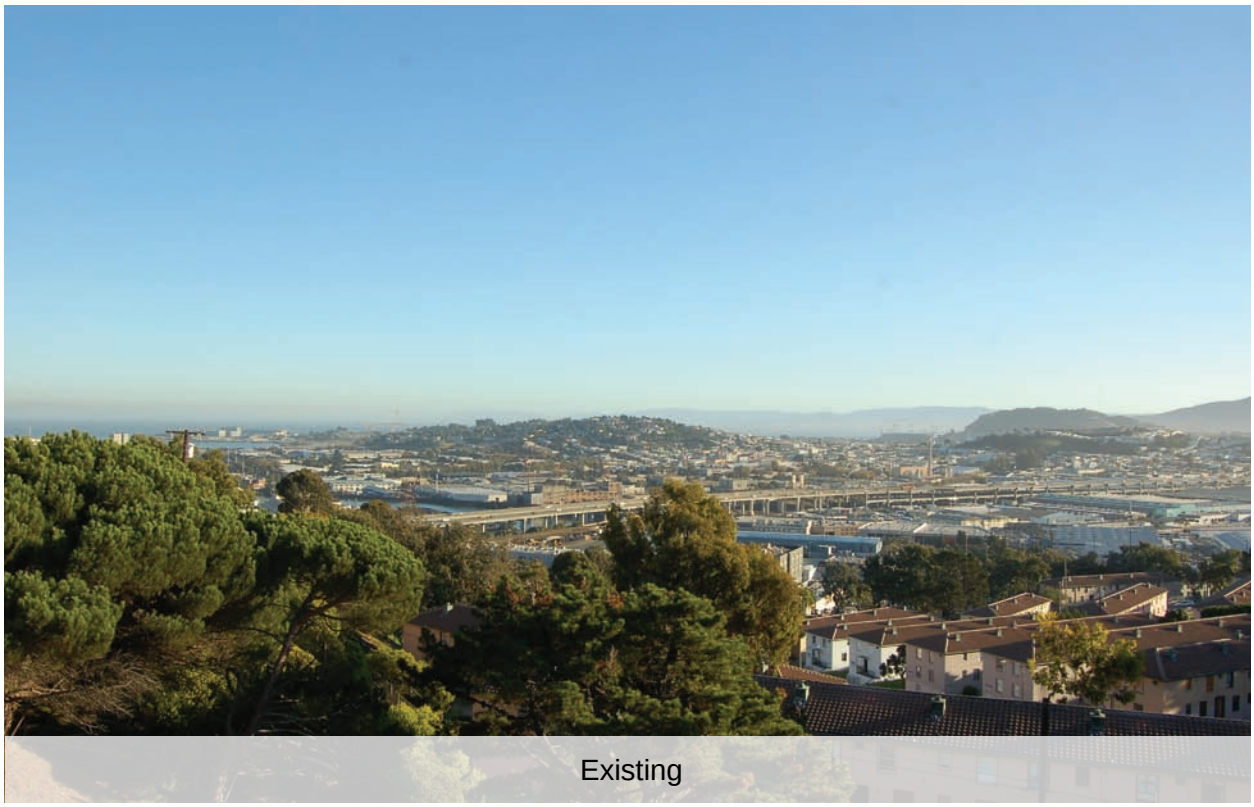
Views of Candlestick Point from long-range vantage points to the north and south or from nearby locations at CPSRA would be similar to views with the Project. Some the towers would have different heights compared to the Project, depending upon the Variant. Views of the relocated 24-story tower with Tower Variant B, C, or D would be apparent from locations to the south, but Tower Variant B or C would also

remove one or two towers from Candlestick Point North near Candlestick Point North Neighborhood Park, and views of residential towers from near that proposed park would vary from those with the Project. The towers at Candlestick Point would range from 220 feet to 420 feet in height. Tower Variant D would relocate one 32-story tower farther from CPSRA and would reduce the height of three towers adjacent to CPSRA (two by three stories and one by six stories), compared to the Project (see Figure IV-16a. Those changes would reduce the visibility of towers from CPSRA open space. Among the Tower Variants, Tower Variant D would have the most changes, compared to the Project, in terms total numbers of towers and larger maximum floor sizes. Therefore, the text below provides more detailed discussion of the visual quality effects of Tower Variant D.

Figure IV-16b (Tower Variant D, View 4: South from Potrero Hill) through Figure IV-16k (Tower Variant D, View 19: East from Hunters Point Hill Open Space) include visual simulations of Tower Variant D from 10 of the 20 viewpoints provided in Section III.E (Aesthetics). Figure III.E-11 (View 1: Southeast from Twin Peaks) through Figure III.E-30 (View 20: Southeast from Heron's Head Park). Figure IV-16b through Figure IV-16k can be compared to the corresponding visual simulations for the Project from those ten locations. The ten locations provide representative information of visual effects of Candlestick Point Tower Variant D (refer to Figure III.E-10 [Viewpoint Locations], page III.E-23).

Figure IV-16b (Tower Variant D, View 4: South from Potrero Hill) illustrates the long-range view from Potrero Hill to the south and the Bay beyond that would include Tower Variant D residential towers at Candlestick Point, between Hunters Point Hill and Bayview Hill, ranging from 240 feet to a maximum 420 feet in height, as with the Project. The towers would replace distant existing views of Candlestick Park stadium and surrounding parking areas. The towers would appear similar to conditions with the Project, as shown in Figure III.E-14 (View 4: South from Potrero Hill). The Tower Variant would be visible from this location, against San Francisco Bay as a background, and the residential towers at Candlestick Point would be a new built element between Bayview Hill and Hunters Point Hill. As with the Project, views of the Bay or the East Bay hills would be partially blocked, but a substantial portion of the view would remain. HPS Phase II would also be a new element seen against the Bay and the East Bay hills.

Figure IV-16c (Tower Variant D, View 5: Northeast from Northbound US-101) illustrates the long-range view with Tower Variant D high-rise structures that would be visible on the Candlestick Point portion of the site, ranging from 240 feet to a maximum 420 feet in height, with lower-scale development to the west. Tower Variant D would include an additional 240-foot tower at Candlestick Point Center, visible east of Bayview Hill in Figure IV-16c The towers would appear relatively clustered, compared to conditions with the Project shown in Figure III.E-15 (View 5: Northeast from Northbound US-101). The high-rise buildings would be prominent, but would not obstruct views of Bayview Hill. As with the Project, the easterly towers in this view would be on land that was formerly part of the CPSRA. The shoreline of CPSRA would be visible as the foreground. Bayview Hill would continue as a landmark and the Bay would continue as foreground in this view.



Existing



Proposed

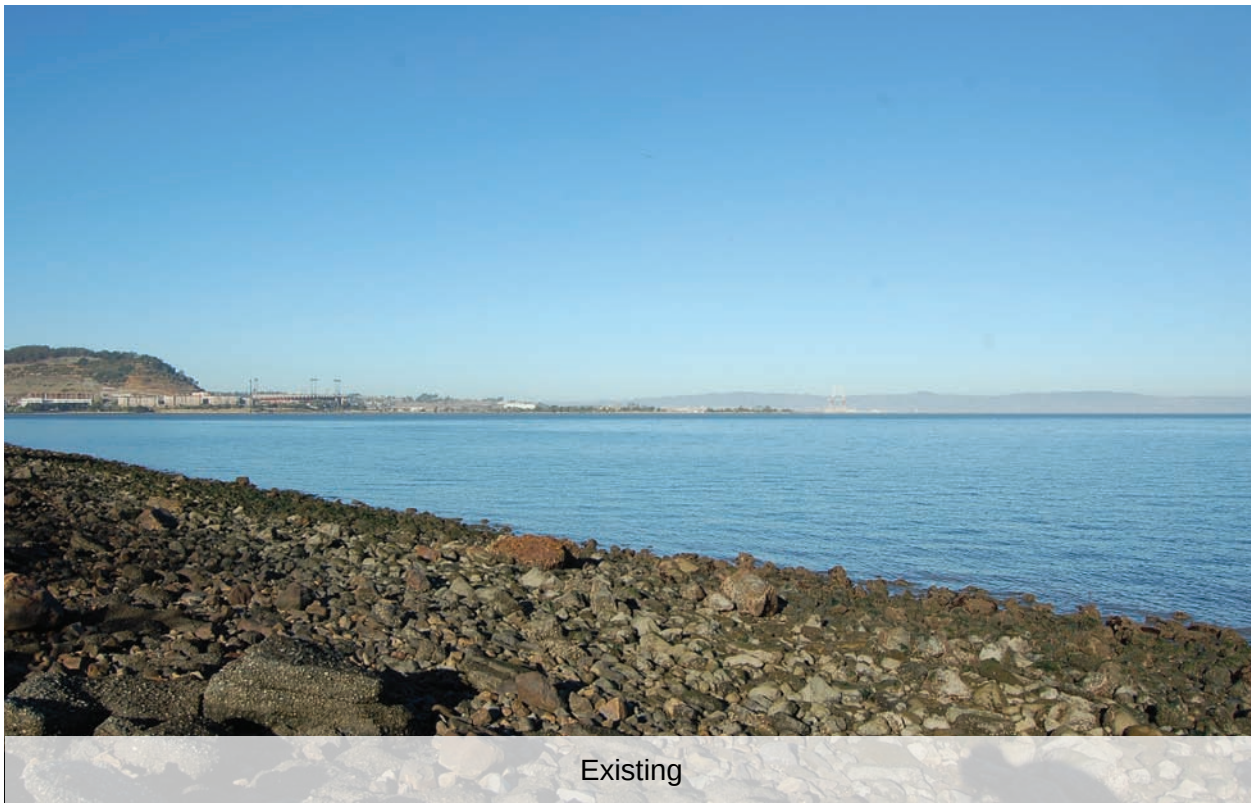
SOURCE: Lennar Urban, 2010.

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FIGURE IV-16b

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 4: SOUTH FROM POTRERO HILL



Existing



Proposed

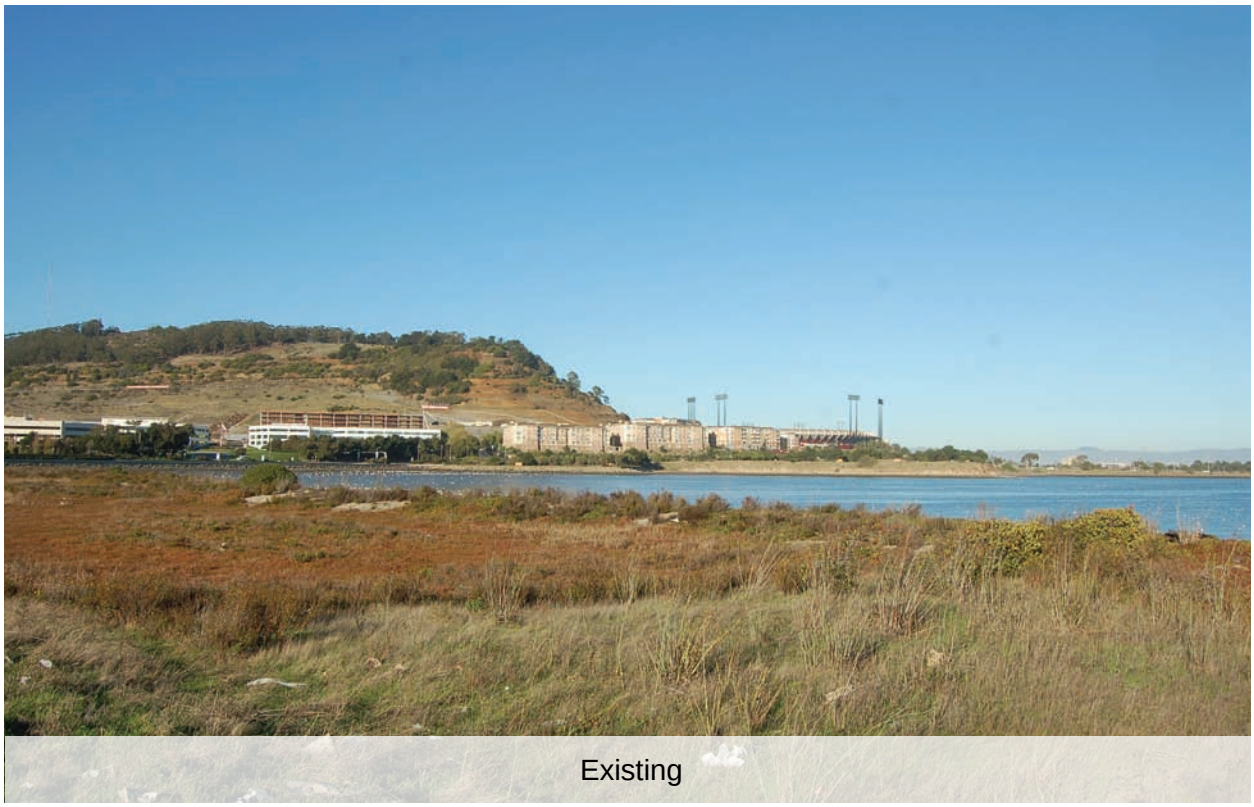
SOURCE: Lennar Urban, 2010.

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FIGURE IV-16c

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 5: NORTHEAST FROM NORTHBOUND US-101



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16d

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 6: NORTHEAST FROM US 101 AT HARNEY WAY OFF-RAMP



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16e

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 7: NORTHEAST FROM SAN BRUNO MOUNTAIN



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16f

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 9: NORTH FROM CPSRA SOUTH OF HARNEY WAY



Existing



Proposed

SOURCE: Lennar Urban, 2010.

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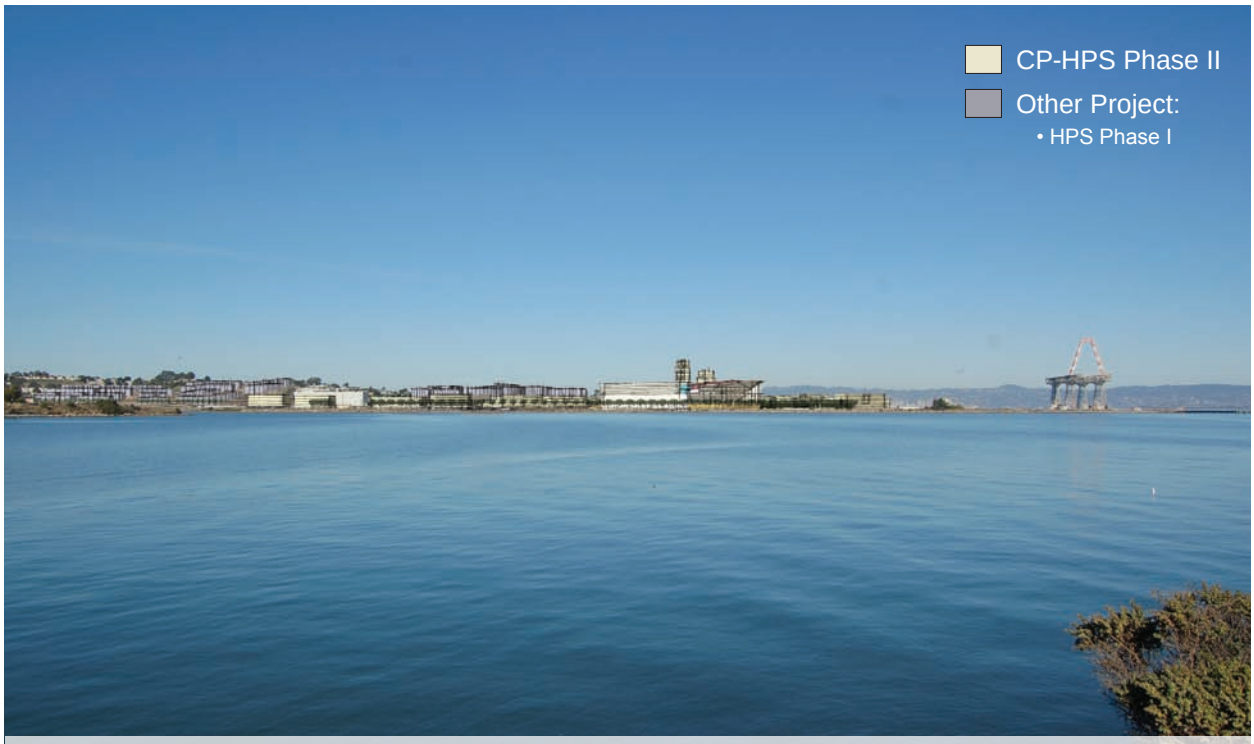
FIGURE IV-16g

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 11: NORTHWEST FROM CPSRA



Existing



Proposed

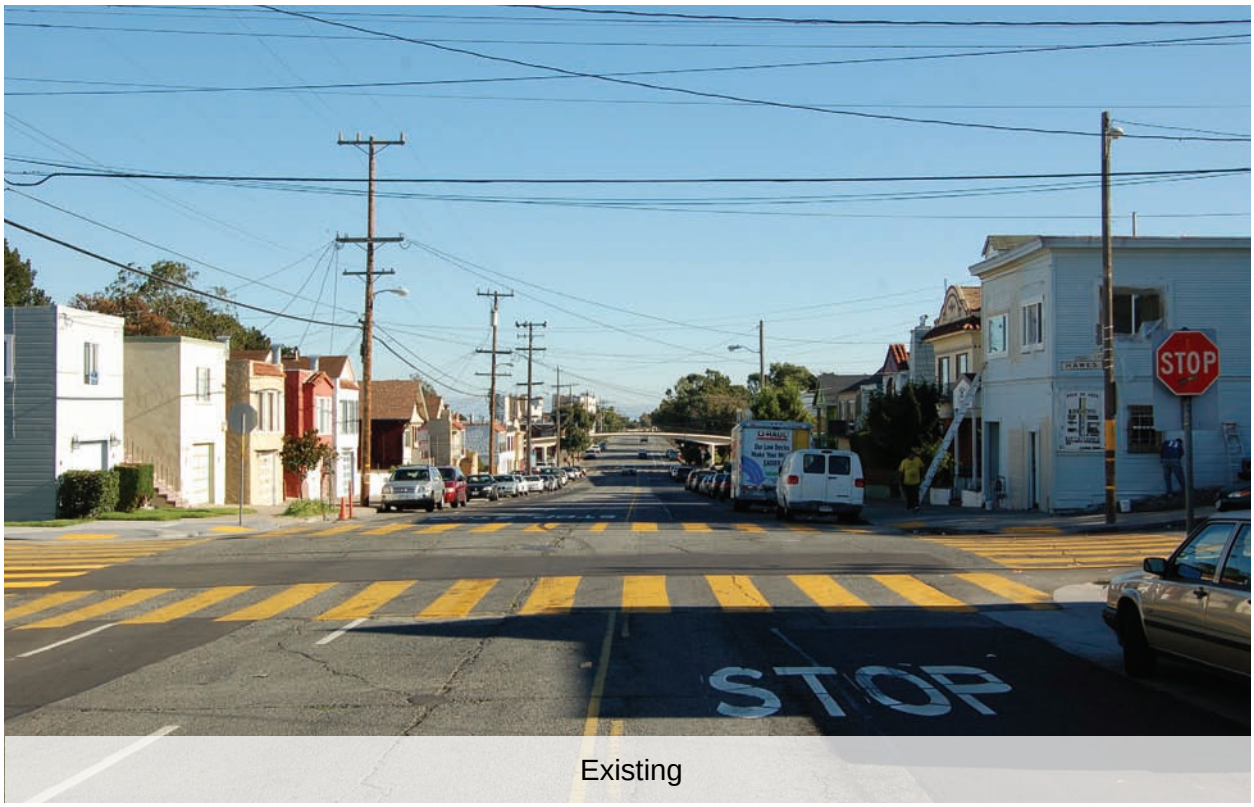
SOURCE: Lennar Urban, 2010.

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FIGURE IV-16h

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 17: NORTHEAST FROM CPSRA





SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16i

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 12: SOUTHEAST FROM GILMAN AVENUE





SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16j

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 16: SOUTHWEST FROM MARINER VILLAGE



Existing



Proposed

SOURCE: Lennar Urban, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE IV-16k

Candlestick Point — Hunters Point Shipyard Phase II EIR

TOWER VARIANT D
VIEW 19: EAST FROM HUNTERS POINT HILL OPEN SPACE

As shown in Figure IV-16d (Tower Variant D, View 6: Northeast from US-101 at Harney Way Off-Ramp), Tower Variant D would introduce high-rise structures that would be visible on the Candlestick Point portion of the site, ranging from 240 feet to a maximum 420 feet in height, with lower-scale development to the west. The high-rise buildings would be prominent, but would not obstruct views of Bayview Hill. Two 32-story towers in Candlestick Point North would be visible east of Bayview Hill. The easterly towers in this view would be on part of the land exchanged with the CPSRA. Conditions would be similar to those with the Project, shown in Figure III.E-16 (View 6: Northeast from US-101 at Harney Way Off-Ramp). The proposed residential development at Executive Park (not a part of the Project), west of Candlestick Point, would be visible against the background of Bayview Hill. The Bay would continue to be visible in the foreground. Bayview Hill would continue as a key visual feature in this view.

As shown in Figure IV-16e (Tower Variant D, View 7: Northeast from San Bruno Mountain), Tower Variant D would introduce high-rise buildings, ranging from 240 feet to a maximum 420 feet in height, at Candlestick Point, and views of the 49ers Stadium, the new marina, and two towers up to 240 feet to 370 feet high at HPS Phase II. Two 32-story towers in Candlestick Point North would be visible east of Bayview Hill. From this viewpoint, the Tower Variant and the Project would have similar effects, as shown in Figure III.E-17 (View 7: Northeast from San Bruno Mountain). The panoramic view of the Bay would still be held from this viewpoint. The shoreline of CPSRA would be visible as the foreground.

Figure IV-16f (Tower Variant D, View 9: North from CPSRA South of Harney Way) is a short-range view from CPSRA towards Candlestick Park stadium, the upper sections of which are visible in the existing setting. The planted areas in the foreground are within the CPSRA. With Tower Variant D and the Project, Candlestick Park stadium would be demolished and residential towers would be visible. From this location in the western part of CPSRA, short- and mid-range views of the stadium would be replaced with Tower Variant development, including the additional 24-story tower at Candlestick Point Center, and the 31-story (reduced from 37 stories) towers in Candlestick Point South. Compared to Project conditions viewed at this location, as shown in Figure III.E-19 (View 9: North from CPSRA South of Harney Way), Tower Variant D would include views of more new development. From other locations in CPSRA, however, views of new development would be reduced, because one tower would be relocated farther away from CPSRA, and three towers adjacent to CPSRA would be reduced in height by three to six stories.

As shown in Figure IV-16g (Tower Variant D, View 11: Northwest from CPSRA), the Tower Variant would introduce residential towers and other structures at Candlestick Point, as seen beyond the shoreline of the CPSRA, and would obstruct the view of portions of Bayview Hill. West of Candlestick Point, existing and approved residential development at Executive Park would be visible. The Candlestick Point towers, including the additional 24-story tower at Candlestick Point Center, and the 31-story (reduced from 37 stories) towers in Candlestick Point South, ranging from 220 feet to a maximum 420 feet in height, would be a substantial change in the existing low-scale pattern in this view, and would block distant views of neighborhoods to the north. The shoreline of CPSRA would be visible as the foreground. As with Project conditions viewed at this location, shown in Figure III.E-21 (View 11: Northwest from CPSRA), Tower Variant D would include views of new development clustered near Bayview Hill. Views of Candlestick Point development to east would also be similar with Tower Variant D and the Project. The larger, 12,500-square-foot maximum floor sizes with Tower Variant D would be apparent in this view, compared to the 10,500-square-foot maximum floor sizes with the Project; the overall change in views would be similar.

Figure IV-16i (Tower Variant D, View 12: Southeast from Gilman Avenue) shows the residential streetscape on Gilman Avenue looking southeast toward the Candlestick Point site. Tower Variant D would introduce two buildings up to 320 feet in height on the north side of Gilman Avenue visible in the distance. The Project would also have two towers at that location; Tower Variant D would increase the height of one tower closer to the viewpoint from 22 stories to 32 stories. As with the Project, the Tower Variant would include roadway and streetscape improvements, also illustrated in Figure IV-16h. Compared to Project conditions viewed at this location, as shown in Figure III.E-22 (View 12: Southeast from Gilman Avenue), Tower Variant D would have more limited views of 31-story (reduced from 37 stories) towers in Candlestick Point South.

Figure IV-16j (Tower Variant D, View 16: Southwest from Mariner Village) shows a view south from Mariner Village on LaSalle Avenue on Hunters Point Hill. The existing foreground includes undeveloped areas of the Shipyard south of Crisp Road. The existing buildings south of Crisp are UCSF facilities that are not part of the HPS Phase II site. With Tower Variant D, Candlestick Point towers, ranging from 220 feet to 420 feet in height, would be a substantial change in the existing low-scale pattern in this view. The shoreline of CPSRA would be visible as the foreground. Other Candlestick Park development would be visible to the north and on Jamestown Avenue at the base of Bayview Hill. The view would also include the Yosemite Slough bridge, improved open space at HPS Phase II, and buildings on Crisp Road. Compared to Project conditions viewed at this location, as shown in Figure III.E-26 (View 16: Southwest from Mariner Village), Tower Variant D would have similar effects.

Figure IV-16h (Tower Variant D, View 17: Northeast from CPSRA) includes the Bay in the foreground and existing buildings at the Shipyard. Views of Tower Variant D development at the Shipyard would include 49ers Stadium, the new marina, and Research & Development buildings. A residential tower, up to 370 feet in height, would be visible beyond the stadium. As noted in the description of Tower Variant D, above, the only change at HPS Phase II would the maximum 12,500-square-foot residential tower floor sizes, compared to the 10,500-square-foot maximum floor sizes with the Project. As shown in this view, the change in floor sizes with Tower Variant D would not alter visual conditions compared with the Project, illustrated by Figure III.E-27 (View 17: Northeast from CPSRA).

Figure IV-16k (Tower Variant D, View 19: East from Hunters Point Hill Open Space) shows a view from open space on Northridge Road on Hunters Point Hill towards the southeast. Tower Variant D would replace the existing structures in the mid ground with mid-rise and two residential towers, up to 270 feet to 370 feet in height. New open space at the Shipyard would be visible at the base of the hill. To the south, the approved HPS Phase I development, not part of the Project and currently under construction, would be visible. As noted in the description of Tower Variant D, above, the only change at HPS Phase II would the maximum 12,500-square-foot residential tower floor sizes, compared to the 10,500-square-foot maximum floor sizes with the Project. As shown in this view, the change in floor sizes with Tower Variant would not alter visual conditions with the Project in Figure III.E-29 (View 19: East from Hunters Point Hill Open Space).

Development of a Tower Variant would not have a substantial adverse effect on a scenic vista. The relocation of a residential tower would not substantially modify views of the Project vicinity, block views of scenic resources across the Project area, or substantially alter or degrade the scenic quality of a view. Impacts would be less than significant.

Development of a Tower Variant would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting. As the footprint of development would be the same as the Project, impacts would be less than significant, similar to the Project.

- Development of a Tower Variant would not substantially degrade the existing visual character or quality of the site or its surroundings. Each of the Tower Variants would change the heights of some the towers or relocate up to five towers. Tower Variant D would have a maximum 12,500-square-foot residential tower floor size, compared to the 10,500-square-foot maximum floor size with the Project. The Tower Variants' effects on visual character would vary from Project effects, with more potential clustering of towers in Candlestick Point, and changes in visibility of some towers from locations in CPSRA. The change in tower floor sizes would not change the visual effects at HPS Phase II, compared with the Project. The Tower Variants, as with the Project, would have a less-than-significant effect on aesthetics, visual character, scenic resources, or scenic vista, As discussed in Section III.E, Draft EIR pages III.E-56 to -57, overall, development of the Project would not block publicly accessible views of the Bay or other scenic vistas. Public access areas, both City and State parks, would maintain views from the Project site toward the East Bay and the Bay. While development of the Project would include several high-rise towers, these towers are not clustered, and would not substantially obstruct, alter, or degrade the quality of views of the Bay or beyond from any long-range viewpoints.

  Thus, the overall change in visual effects compared to existing conditions with the Tower Variants would be as described for the Project effects in Section III.E (Aesthetics). The Tower Variants would have less-than-significant impacts on scenic vistas, scenic resources, and visual quality.

  As with the Project, a Tower Variant would create new sources of light, including light emanating from parking areas and the 49ers stadium, which could be obtrusive in nearby residential areas. Each of the new residential towers would require appropriate operational and security lighting that could result in a greater overall number of lighting sources than the Project. These lighting sources would be consistent with those anticipated with the Project, as well as those existing in an urban, developed area. Mitigation measures MM AE-7a.1 through MM AE-7a.4, MM AE-7b.1, and MM AE-7b.2 would reduce lighting impacts to less than significant for this variant.

Shadows

- A Tower Variant would include one additional residential tower and could change the location of one to three towers, depending on the Variant. The introduction of a new tower, the increased or decreased height of some towers, the change in maximum floor sizes from 10,500 square feet to 12,500 square feet, and the changed location of some towers would modify shadow impacts compared to the Project effects.

Construction

As with the Project, construction activities of the Tower Variant would not result in shadow effects on open space.

Operation

Development of a Tower Variant would result in new structures over 40 feet in height ranging up to 420 feet in height and would extend well above surrounding buildings and cast shadows on nearby public open spaces. Tower Variant A would add ten stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower, as shown in Figure IV-14. Three other residential towers at Candlestick Point South would have three to four fewer floors. Tower Variant B would have an additional 24-story residential tower at Candlestick Point Center. One 17-story tower at Candlestick Point North would be removed as shown in Figure IV-15. Three other towers at Candlestick Point South would have would have two to four fewer floors. Tower Variant C would have an additional 24-story residential tower at Candlestick Point Center, as with Tower Variant B, as shown in Figure IV-16. Tower Variant C would also add ten stories to one of the 22-story residential towers at Candlestick Point North, as with Tower Variant A, resulting in a 32-story residential tower; one 17-story tower and one 22-story at Candlestick Point North would be removed and at Candlestick Point South, one tower would have would have two fewer floors and one would have six fewer floors. Tower Variant D would reduce one 37-story tower to 31 stories, or six fewer floors, in Candlestick Point South; one 27-story residential tower at Candlestick Point South would be lowered to 24 stories, or three fewer floors; and one 32-story tower would be relocated from Candlestick Point South to Candlestick Point North. This Variant would add 10 stories to one of the 22-story residential towers at Candlestick Point North, resulting in a 32-story residential tower, as with Tower Variants A and C; one 22-story tower and one 17-story tower would be relocated within Candlestick Point North; one residential tower at Candlestick Point North and one residential tower at Candlestick Point South would be lowered to 24 stories, or three fewer floors, as with Tower Variant A. This Variant would have an additional 24-story residential tower at Candlestick Point Center, as with Tower Variants B and C. This Variant would have 12 towers at Candlestick Point, compared to 11 towers with the Project.

Project plans have identified the locations of towers, but tower designs are preliminary. The length and duration of shadows cast would be influenced by elements of building design, such as building height, shape, massing, and setbacks. Potential impacts to shade-sensitive locations, such as parks and open space, would be influenced by the location of shade-sensitive uses within the parks and open spaces. The increase in height of one residential tower, from 220 to 320 feet (per Variant A, Variant C, and Variant D) and the inclusion of one new residential tower (with a height of 240 feet) and the relocation of towers (per Variant B, Variant C, and Variant D), would increase potential shading impacts on existing parks and open spaces—Gilman Park—and proposed parks and open spaces—Candlestick Point Neighborhood Park; Bayview Gardens/Wedge Park; and Mini Wedge-Park—and in CPSRA areas near the additional towers. The Tower Variants would also remove one or two residential towers (per Variant B and Variant C), and would reduce the number of stories on up to three towers (all Tower Variants).

As discussed in Section III.F (Shadows), *Planning Code* Section 295 prohibits the issuance of building permits for structures over 40 feet in height that would cast shade or shadow on property with the jurisdiction of, or designated to be acquired by, the Recreation and Park Commission between one hour after sunrise to one hour before sunset at any time of year, unless the Planning Commission determines that the shade or shadow would have an insignificant adverse impact on the use of such property.

As required by *Planning Code* Section 295, the Recreation and Park Commission and the Planning Commission have adopted criteria for the review of shadow effects. For parks for which "shadow budgets"

have not been adopted, the current criteria allow an additional new shadow budget of 0.1 percent for parks larger than 2 acres with annual shadow loads between 20 and 40 percent, expressed in available square-foot-hours of sunlight compared to square-foot-hours of shade. For larger parks with existing shadow loads less than 20 percent, an additional new shadow budget of 1.0 percent would be allowed. The increase is based on calculations of the "Annual Available Sunlight" (AAS) for that park, expressed in square-foot-hours of sunlight (during each day an hour after sunrise to an hour before sunset summed over the course of a year, ignoring shadow from any surrounding structures, and from clouds, fog, and solar eclipses). The shadow impact of the Project is defined as the shadow in square-foot-hours cast by the Project divided by the AAS, expressed as a percentage.

To evaluate potential effects, a shadow modeling study of Tower Variants C and D was completed by CADP, Inc.[1268] Figure IV-17 (Candlestick Point: Tower Variant C Year-Round Shadow Trace) and Figure IV-17a (Candlestick Point: Tower Variant D Year-Round Shadow Trace) are the "shadow fan" or "shadow trace" identifying the maximum extent of all Project-related shadows from one hour after sunrise to one hour before sunset over an entire year, which is the time period specified in *Planning Code* Section 295. The year-round shadow trace is further over-inclusive in that it includes shadow from all buildings within the Project site, including those that would not exceed 40 feet in height and, therefore, would not be subject to the requirements of Section 295. The shadow trace shows that Tower Variant C and Tower Variant D, compared to the Project plans, would shade Gilman Park during the hours specified in Section 295. (As discussed in Section III.F, the Project would add shadows to Gilman Park, but those effects would be from potential 40-foot-high Project buildings south of the park, which are not considered to be adverse effects under Section 295.)

Gilman Park, at 4.4 acres, is a larger park without an adopted shadow budget, and an existing shadow load of less than 20 percent. Therefore, under Section 295, an annual increase of 1.0 percent would be permitted and would not be considered to create a significant effect on the park.

The CADP study also evaluated the Tower Variant C and Tower Variant D effects on Gilman Park with respect to AAS. CADP used computer models to calculate the net increase in square feet, and square-foot-hours, of shade on the park, from one hour after sunrise to one hour before sunset, at 15-minute intervals, at one-week increments, for six months of the year. The calculations are converted to a total annual increase in square-foot-hours of shade, compared to total theoretical square-foot-hours of sun in the park. Because the streets adjacent to the park are bounded by parking lots and low-rise buildings, the analysis conservatively assumed there is no existing shadow load on the park, and that the Tower Variant effects would be net new conditions. The analysis also does not account for existing shading from trees or the service building within the park. On the basis of available observations of Gilman Park, the park is used during mid-day and afternoon periods, by neighborhood residents, and students at adjacent Bret Harte Elementary School. The park is relatively less patronized in morning hours.

[1268]This shadow analysis evaluated Tower Variant C and Tower Variant D, which would include a 24-story tower at a location near Gilman Park, up to three relocated towers and the additional stories on a tower at Candlestick Point North. Variants C and D would have the greatest differences in increased shadow effects, compared to those with the Project. Tower Variant D would have floor sizes with a maximum of 12,500 square feet, compared to 10,500-square-foot maximum floor sizes with the Project. (CADP, Inc., Gilman Park Shadow Calculations, Variant C, October 2009; CADP, Inc., Gilman Park Shadow Calculations, Variant D, March 2010.)



SOURCE: Lennar Urban, RHAA, CADP, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

CANDLESTICK POINT: TOWER VARIANT C YEAR ROUND SHADOW TRACE

FIGURE IV-17



SOURCE: Lennar Urban, RHAA, CADP, 2010.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

CANDLESTICK POINT: TOWER VARIANT D YEAR-ROUND SHADOW TRACE

FIGURE IV-17a

Tower Variant C and Tower Variant D would shade a portion of Gilman Park from morning to mid-day periods throughout the year, in the first three to four hours after the sunrise plus one-hour cutoff specified by Section 295.[1269] There would be no new shadow from the Tower Variant after about 12:30 P.M. on any day of the year. The effects would vary by season. On June 21, new shadow would occur between about 6:45 A.M. PDT (1 hour after sunrise), and would cover about 21 percent of the park to about 9:45 A.M. on less than 1 percent of the park. On September 21 and March 21, new shadow would occur between about 8:00 A.M. PDT (1 hour after sunrise), on about 32 percent of the park, to about 11:30 A.M., on less than 1 percent of the park. On December 21, new shadow would occur between about 8:00 A.M. PST (1 hour after sunrise), on about 54 percent of the park (Tower Variant C) or 44 percent (Tower Variant D), to about 12:15 P.M. on less than 1 percent of the park. Overall, while those effects would occur for up to four hours after the sunrise plus one-hour cutoff time, in spring, summer, and fall months, the new shade would affect 10 percent or less of Gilman Park by 9:00 A.M. or earlier. In December, the new shade would affect 10 percent or less of Gilman Park by about 10:15 A.M.

Figure IV-18 (Gilman Park—Existing Conditions) is an aerial view showing existing features of Gilman Park. Figure IV-19 (Gilman Park: Tower Variant C Shadows—November 29 [8:05 A.M.]) and Figure IV-20 (Gilman Park: Tower Variant C Shadows—December 20 [8:20 A.M.]) illustrate Tower Variant C shadow at periods of maximum shadow impact, at one hour after sunrise in late fall and winter. Figure IV-20a (Gilman Park: Tower Variant D Shadows—November 8 [7:45 A.M.]) and Figure IV-20b (Gilman Park: Tower Variant D Shadows—December 20 [8:20 A.M.]) illustrate Tower Variant D shadow at periods of maximum shadow impact, at one hour after sunrise in late fall and winter.

Gilman Park is 191,631 square feet (4.4 acres). Tower Variant C would add approximately 21,847,927 new annual square-foot-hours of shadow to the potential of approximately 696,493,920 square-foot-hours of sun, increasing shade square-foot-hours by 3.1 percent. Tower Variant D would add approximately 21,666,526 new annual square-foot-hours of shadow, also increasing shade square-foot-hours by 3.1 percent. This would be greater than the 1.0 percent permitted as new shadow on parks larger than two acres with existing shadow loads less than 20 percent, under current Planning Department criteria.

Therefore, the Tower Variant would add shadows to Gilman Park during the hours between one hour after sunrise and one hour before sunset, with a new shadow load greater than 1.0 percent. This new shadow could have an adverse effect on the use of park. While Tower Variant A would not add shade after late morning or midday periods at any time of year, and the park would not be affected in afternoon periods of use, the shadow effect is conservatively considered to be a significant and unavoidable impact of Tower Variants C and D.

As with the Project, the Tower Variants would shade an area of Bayview Park, owned by the SFRPD, that does not provide any active uses and is relatively steep. The Tower Variants would only shade Bayview Park during the first hour after sunrise in spring, summer, and fall months, and would not create any new shadow by 10:00 A.M. at any time of year. This would not be considered a significant adverse shadow impact on SFRPD open space.

[1269] The sunrise plus one hour cutoff on days when the Tower Variant would cast a shadow on the park would range from about 6:50 A.M. PDT on June 20 to about 8:15 A.M. PST on December 20.



SOURCE: PBS&J, 2009.

PBS&J 10.31.09 08068 | JCS | 09

Candlestick Point — Hunters Point Shipyard Phase II EIR

GILMAN PARK — EXISTING CONDITIONS

FIGURE IV-18



SOURCE: Lennar Urban, RHAA, CADP, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

GILMAN PARK: TOWER VARIANT C SHADOWS—NOVEMBER 29 (8:05 AM)

FIGURE IV-19



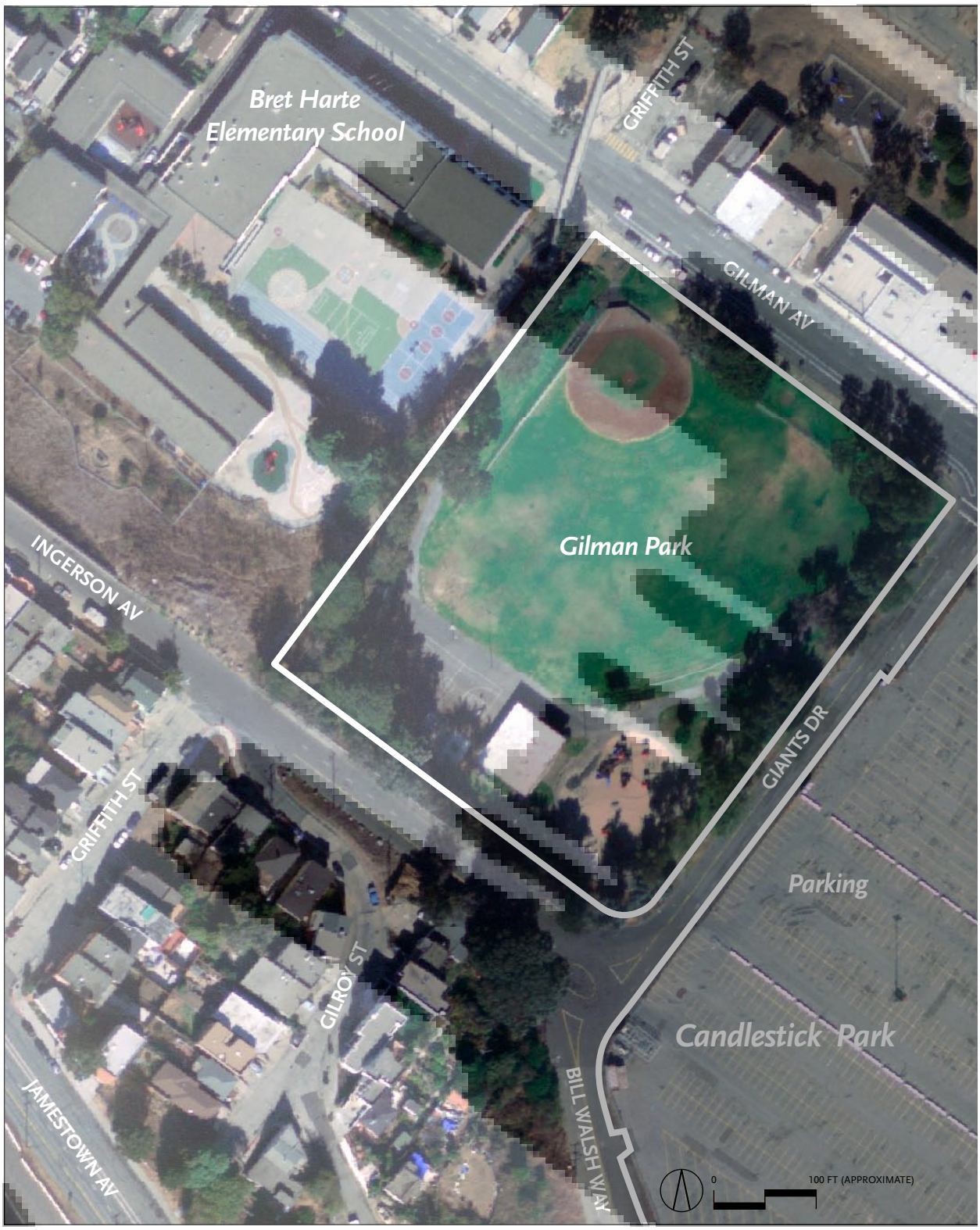
SOURCE: Lennar Urban, RHAA, CADP, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

GILMAN PARK: TOWER VARIANT C SHADOWS—DECEMBER 20 (8:20 AM)

FIGURE IV-20



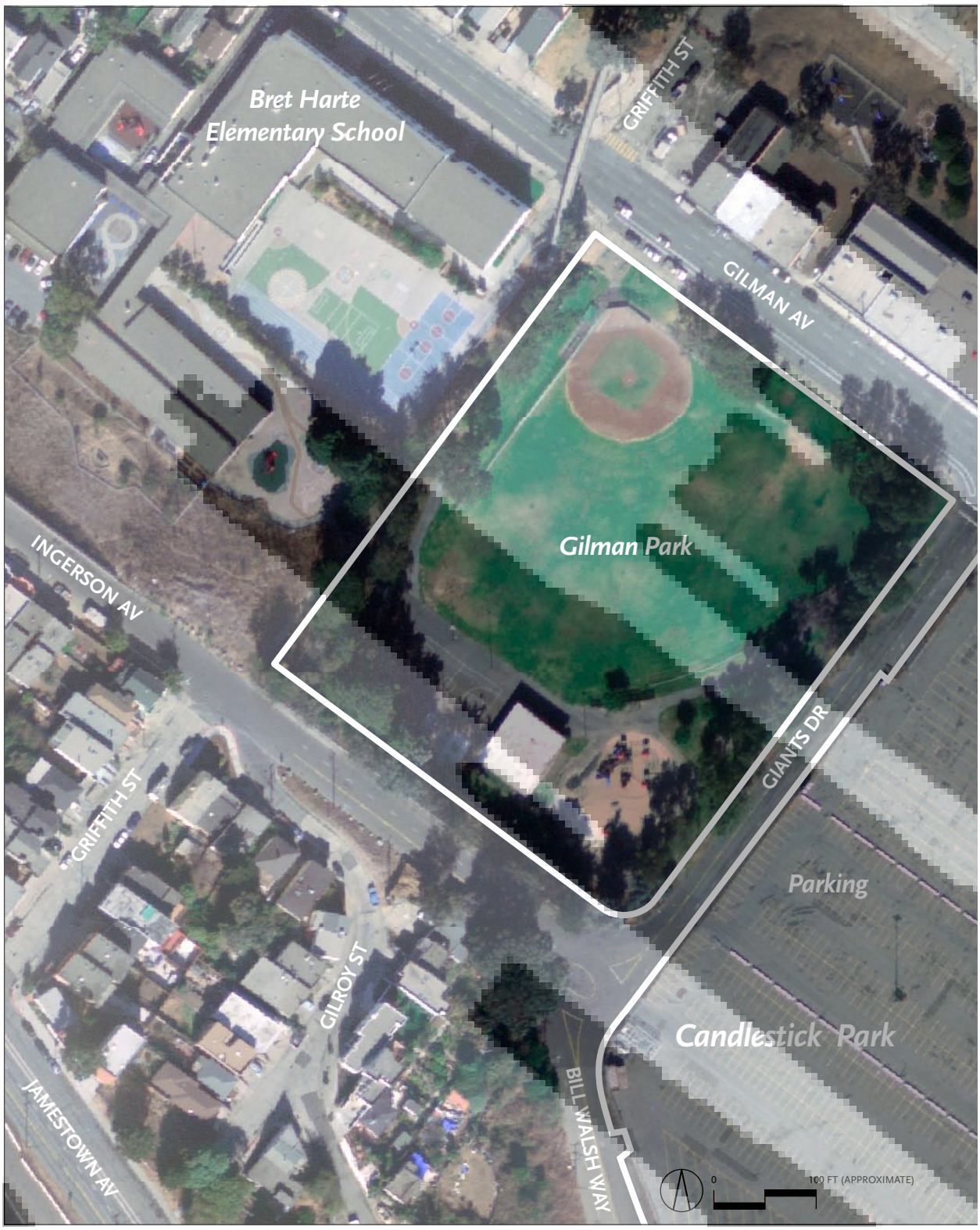
SOURCE: Lennar Urban, RHAA, CADP, 2010.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

GILMAN PARK: TOWER VARIANT D SHADOWS — NOVEMBER 8 (7:45 AM PST)

FIGURE IV-20a



SOURCE: Lennar Urban, RHAA, CADP, 2010.

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FIGURE IV-20b

GILMAN PARK: TOWER VARIANT D SHADOWS — DECEMBER 20 (8:20 AM PST)

Tower Variant effects on shadows on the CPSRA would be similar or slightly reduced compared to the Project depending upon the variant: towers near the CPSRA would be three to six stories shorter.

As with the Project, the CPSRA would be affected by new shade in the afternoons, but most areas would experience limited to no new shadow from the Project. Other areas of the CPSRA would largely continue to remain in sun throughout the year. Tower Variant D shadow would not interfere with the public's use or enjoyment of the CPSRA. Activities in these areas, such as windsurfing launching, walking, jogging, and fishing, would not be affected by the new shade.

Shadows cast by Tower Variant D, as with the Project, on proposed new neighborhood parks at Candlestick Point throughout the year would range from little or no shading to large areas of certain parks receiving new shade, particularly in the late afternoon during the vernal and autumnal equinoxes. The orientation of the relatively narrow Alice Griffith Neighborhood and Mini-Wedge Parks with respect to the path of the sun and the close proximity of Tower Variant buildings along the parks' southwestern boundaries combine to make them most susceptible to new shade. Tower Variant D, because of changes in tower locations and height, would shade different areas of proposed open space compared to the Project effects. Overall, given the heights, layouts, and orientations of the Tower Variant buildings, the neighborhood parks would experience variable levels of shading throughout the day, generally receiving some new shade from morning until noon in spring, summer, and fall with a lesser increase in the afternoons in winter, spring, and fall. Public use of these proposed new parks would not be expected to be adversely affected by the shade conditions.

Tower Variant D would not change any tower locations or heights at HPS Phase II; the two residential towers at HPS Phase II would have floor sizes with a maximum of 12,500 square feet, compared to 10,500-square-foot maximum floor sizes with the Project. Shadow effects at HPS Phase II with this change in tower dimension would be similar to the Project and would be less than significant, as shown Figure III.F-15 (Hunters Point Shipyard Phase II: Proposed Project Year-Round Shadow Trace) through Figure III.F-27 (Hunters Point Shipyard Phase II: Shadow Patterns—September 21 [3 PM PDT]) for shadow conditions at HPS Phase II with the Project at 10:00 A.M., noon, and 3:00 P.M. Pacific Standard Time (PST) on December 21 and March 21, and Pacific Daylight Time (PDT) on June 21 and September 21, and discussed on pages III.F-26 through -40 of the Draft EIR.

With appropriate design of the proposed parks and open space, to minimize the installation of shade-sensitive uses at locations that would receive the greatest amount of shading, adverse shadow impacts would be minimized, and Tower Variant impacts to proposed new parks would be less than significant.

Wind

Each of the Tower Variants would change the location of a residential tower between 24 and 32 stories in height (depending on the Variant). As these towers would exceed 100 feet in height, these residential towers have the potential to result in pedestrian wind impacts, as discussed below. In addition, as the location and or height of residential towers would change, this would modify the location of pedestrian wind impacts.

Construction

Construction activities of the Tower Variants would not result in additional wind impacts, and would be similar to the Project. Impacts such as fugitive dust emissions and erosion from wind are addressed in Section III.H and Section III.M.

Operation

Because of their height, the residential towers would have the potential to accelerate winds in nearby pedestrian sidewalk areas or public open spaces. Similar to the Project, the street grid with a Tower Variant would not align directly with predominant west and west-northwest wind directions, which would reduce potentially significant pedestrian-level wind acceleration. Due to the location and height of the residential towers with all Tower Variants, a Tower Variant could affect pedestrian-level wind conditions in proposed parks—Candlestick Point Neighborhood Park; Bayview Gardens/Wedge Park; and Mini Wedge-Park—and in CPSRA areas near the towers. The potential pedestrian-level wind conditions would be influenced by building design, such as building height, shape, massing, setbacks, and location of pedestrian areas. However, although the Tower Variant plans have identified the potential locations of the additional towers, tower designs are preliminary, and thus a more detailed analysis of the potential for building design to generate pedestrian-level wind impacts is not feasible at this time.

- As with the Project, all four Tower Variants would have the potential to create potentially significant pedestrian-level wind impacts that exceed the identified threshold of 26 miles per hour (mph) equivalent wind speed for a single hour of the year. Implementation of mitigation measure MM W-1a (wind modeling), which would require a wind analysis for buildings greater than 100 feet in height, and if determined to be necessary, would require inclusion of a design criteria to reduce pedestrian-level impacts below the threshold, would reduce impacts to a less-than-significant level, similar to the Project.

Air Quality

As the footprint of development, the total amount of development, and the land uses provided with a Tower Variant would be the same as the Project, air quality impacts of a Tower Variant would also be the same as the Project.

Construction

As stated above, overall construction impacts of the Tower Variant with respect to air quality would be similar to the Project. Construction activities would occur throughout the 702-acre Tower Variant site over the approximately 20-year build-out period ending in 2029, with the construction of the additional dwelling units occurring between 2017 and 2021. Similar to the Project, construction activities under the Housing Variant would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures, use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

With respect to construction emissions, construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. However, the BAAQMD does not recommend any significance thresholds for the emissions during construction. Instead, the BAAQMD bases the criteria on a consideration of the mitigation measures to be implemented. If all appropriate emissions mitigation measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, construction emissions are not considered adverse. Fine particulate matter (PM_{10}) is the pollutant of greatest concern with respect to construction activities.[1270] Any project within the City of San Francisco, including the Housing Variant, would be required to comply with *San Francisco Health Code* Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). As such, with implementation of mitigation MM HZ-15, which identifies specific mitigation measures that would be used to reduce emissions associated with construction, impacts from the Tower Variant would be less than significant, similar to the Project.

With respect to airborne human health risks, construction activities associated with the Tower Variant would increase the levels of two potential human health risks: (1) diesel particulate matter (DPM) and (2) dust or particulate matter (PM_{10}) bound to certain metals and/or organic compounds from on-site soils. MM AQ-2.1 (Implement Accelerated Emission Control Device Installation on Construction Equipment) and MM AQ-2.2 (Implement Accelerated Emission Control Device Installation on Construction Equipment Used for Alice Griffith Parcels) would address construction sources of DPM including off-road construction equipment such as lifts, loaders, excavators, dozers, and graders. In addition, the delivery of equipment and construction materials, spoils and debris hauling, and employee commute traffic could contribute to construction-related DPM emissions. In terms of DPM, ENVIRON prepared a human health risk assessment (HRA)[1271] that evaluated potential human health risks associated with construction and operation of the Project. As construction emissions associated with the Tower Variant are expected to be the same as those associated with Project, the Tower Variant would have the same impacts than the Project, would not exceed the BAAQMD CEQA threshold. As the carcinogenic and non-carcinogenic health risks posed by DPM emissions during construction activities associated with development of the Tower Variant have been determined to be below established thresholds, this impact is less than significant with MM AQ-2.1 and MM AQ-2.2, similar to the Project.

Similar to the Project, construction activities at both Candlestick Point and HPS Phase II for the Tower Variant have the potential to generate TACs associated with soil-PM_{10} and an HRA evaluated the potential concentrations of the airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult and child residents, workers, and schoolchildren) in the Project vicinity. As the carcinogenic and noncarcinogenic health risks posed by soil-PM_{10} emissions during construction activities associated with development of the Project have been determined to be below established thresholds, the same impacts would be expected from the Tower Variant. This impact is less than significant with MM HZ-15, similar to the Project.

[1270] BAAQMD. 1999. *BAAQMD CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*. December.
[1271] Environ. 2009. Ambient Air Quality Human Health Risk Assessment: Candlestick Point – Hunters Point Shipyard Phase II Development Plan. September 28. Appendices I & II.

Operation

The level of emissions anticipated with Tower Variant would be the same as the Project; as such impacts to regional and local air quality would be substantially similar to the Project.

Both this variant and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. The Tower Variant, similar to the Project, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. Tower Variant's transportation analysis estimates that a similar development that did not include the trip reduction features of the Utilities Variant would generate 137,282 daily external motor vehicle trips (about 76 percent more than Utilities Variant's daily external motor vehicle trips). Refer to the discussion of Project-related emissions in Section III.H for further clarification.

Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land uses anticipated with Tower Variant would be expected to exceed existing BAAQMD thresholds. Under BAAQMD's current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project, no additional feasible mitigation measures are available to reduce Tower Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact.

With respect to airborne human health risks, emissions associated with operation activities under the Tower Variant would increase the levels of two potential human health risks: (1) TACs and (2) vehicle emissions ($PM_{2.5}$).

This Tower Variant continues to include R&D facilities at HPS Phase II, which are situated on a peninsula extending to the south of other proposed residential areas. As the predominant winds are out of the west, on-site receptors will generally be upwind from these R&D areas. As such, the Project is designed to minimize potential adverse impacts between TAC sources in R&D areas and both on-site and off-site receptors. As discussed for the R&D Variant, an analysis was conducted to determine the potential impacts from a variety of TAC sources in the R&D areas. Details regarding this assessment can be found in Appendix H1, Attachment III.[1272]

The HRA estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. As the Tower Variant has the same configuration as the Project, the estimated cancer risks for long-term residential exposure would be above 10 in one million in an area designated as open space that would extend slightly south beyond the R&D boundary. The maximum estimated cancer risk for a residential receptor in this location would be 17 in one million; the noncarcinogenic health risks would have an HI of 1.7. However, as noted above, this receptor location would be in an area designated as open space, and would not be a residential location. If cancer risks were estimated based on exposure assumptions consistent with recreational use of the open space, the risks would be reduced well below the threshold of 10 in one million. Due to the decrease in the

[1272] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

frequency and duration of potential exposures, the chronic HI would also be reduced below the HI threshold of 1.0

The estimated health risks would be below BAAQMD thresholds for all residential receptor locations as a result of implementation of the Project. As such, impacts would be less than significant with implementation of MM AQ-6.1 and MM AQ-6.2 developed for the Project and also required for the Tower Variant.

- In terms of human health risks associated with vehicle emissions, vehicle emissions along local roadways for the Tower Variant (Variant 3) would remain unchanged from the Project. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the Tower Variant (Variant 3) were estimated at selected roadways and compared against the 0.2 μg/m3 action level to determine the potential health risks on receptors attributed to vehicle emissions from the Tower Variant (Variant 3).

  Several roadway segments were chosen based on whether Project-related traffic would use these streets to access neighboring freeways and other areas of San Francisco and/or currently or would experience significant truck traffic. The roadways chosen include:

  - Third Street
  - Innes Avenue/Hunters Point Boulevard/Evans Avenue
  - Palou Avenue
  - Gilman Avenue/Paul Avenue
  - Harney Way
  - Jamestown Avenue
  - Ingerson Avenue

- With the addition of Variant-related traffic, no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of the 0.2 $\mu g/m^3$ action level.[1273],[1274] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

Noise and Vibration

As the footprint of development, the total amount of development, and the land uses provided with a Tower Variant would be the same as the Project, noise impacts of a Tower Variant would also be the same as the Project.

Construction activities for a Tower Variant would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and

[1273] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Appendix IV, May 4, 2010.

[1274] ENVIRON, *Updated Air Quality Analysis, Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3D, Alternative 2, and Subalternative 4A*, April 26, 2010.

MM NO-1a, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the Tower Variant, but not to a less-than-significant level as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a Tower Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a Tower Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a Tower Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. Measures available to address significant traffic noise increases in these residential areas are limited. The ultimate feasibility and implementation of the noise insulation measures that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City as the lead agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable.

Football games and concerts at the proposed stadium with a Tower Variant would generate noise that would adversely affect surrounding residents, similar to the Project. Implementation of mitigation measure MM NO-7.1 would ensure that nearby residential uses do not experience temporary increases in ambient noise levels within their homes that would exceed 45 dBA; however, as with the Project, the feasibility and practicality of mitigation measure MM NO-7.1 cannot be determined at this time, this impact would remain significant and unavoidable.

The Tower Variant site is not located within an airport land use plan area or near a private airstrip. Furthermore, the Tower Variant does not include an aviation component. Therefore, a Tower Variant will not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources and Paleontological Resources

The footprint of development for a Tower Variant would be the same as for the Project, although the construction of an additional residential tower could slightly increase the extent of ground disturbance associated with excavation for the tower foundation. As such, impacts anticipated for Cultural Resources

including paleontological, archaeological, and historical resources as a result of construction of a Tower Variant would be similar to the Project.

Similar to the Project, impacts associated with construction of an additional residential tower with a Tower Variant could result in significant impacts to paleontological and archaeological resources or result in the disturbance of human remains interred outside formal cemeteries. Implementation of mitigation measures MM CP-2a (archaeological resources), MM CP-3a (paleontological resources), and MM CP-1b.1 and MM CP-1b.2 (historical resources) would reduce construction impacts to archaeological and paleontological resources to a less-than-significant level, similar to the Project.

Construction of the Project was determined to have a significant and unavoidable impact to historic resources due to the proposed demolition of buildings, structures, and objects associated with the area's "transition from early commercial dry dock operation to high tech naval repair and Radiological research and waste treatment facility." While a Tower Variant would retain the buildings and structures in the potential Hunters Point Commercial Drydock District, identified in 1998 as eligible for listing in the National Register of Historic Properties (NRHP), development would result in the demolition of buildings that have been determined eligible for the CRHR and are contributors to the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. This would be a potentially significant impact because the proposed actions would demolish buildings that contribute to a historic district. The impact would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Development of an additional residential tower, or a change in the location of residential towers (at Candlestick Point), would not change the effects to historical resources at HPS Phase II. A Tower Variant would be required to implement mitigation measure MM CP-1b.1 and MM CP-1b.2 (historical resources) which would reduce impacts to the extent feasible. However, implementation of mitigation measure MM CP-1b.1 and MM CP-1b.2 (historical resources) would reduce but not avoid the significant adverse impact. As with the Project, the impact on historical resources with a Tower Variant would remain significant and unavoidable.

As the total amount of development and footprint of development with a Tower Variant would be the same as for the Project, operation of the Tower Variants would not result in adverse effects to cultural resources, and this impact would be less than significant, similar to the Project.

Hazards and Hazardous Materials

The footprint of development for a Tower Variant would be the same as for the Project, although the construction of an additional residential tower could slightly increase the extent of ground disturbance associated with excavation for the tower foundation. As such, impacts from construction of a Tower Variant would be similar to the Project.

Construction activities associated with a Tower Variant would: disturb soil and/or groundwater; result in the handling, stockpiling, and transport of soil; involve demolition or renovation of existing structures that could include asbestos-containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury; expose construction workers to hazardous materials; be a source of hazardous air emissions within one-quarter mile of an existing or planned school; and encounter soils or groundwater that contains contaminants from historic uses that could pose a human health or environmental risk if not properly managed. Each of

these impacts for a Tower Variant would be the same as the Project and would be reduced to a less-than-significant level with implementation of the identified mitigation measures (MM HY-1a.2, MM HZ-1a, MM HZ1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM HY-1a.1, MM HY-1a.3, MM BI-4a.1, MM BI-4a.2, and MM BI-5a.4).

Construction of a Tower Variants would require improvements to existing utility infrastructure and installation of new underground utilities, which could expose construction workers, the public, or the environment to hazardous materials. With one additional residential tower, a Tower Variant could result in an increase in the amount of excavation and a slightly greater level of ground disturbance and excavation than the Project. However, with the implementation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, which require remediation of any contaminated soils, the hazards risk from potential exposure to contaminated soil or groundwater during construction would be reduced to a less-than-significant level, similar to the Project. In addition, mitigation measure MM HZ-2a.2 requires the preparation of a site-specific health and safety plan, which would further ensure that all risks to workers, residents, or the public would be reduced to less than significant, the same as for the Project.

The Tower Variant would require pile supports for the residential towers, the same as the Project. This construction activity could result in groundwater contamination from disturbed soils. Because an additional tower would be constructed under the Tower Variant, the risk of groundwater contamination would be slightly increased. Mitigation measure MM HZ-5a would reduce this impact by requiring a foundation support piles installation plan, which would verify that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. With implementation of this mitigation measure, the impact from potential groundwater contamination would be reduced to a less-than-significant level, the same as for the Project.

Shoreline improvements would occur under the Tower Variant the same as for the Project. Shoreline improvements would require concurrence of BCDC, San Francisco RWQCB, and USACE. That permit would contain numerous conditions to ensure that the construction activities are conducted in a manner that is protective of aquatic resources. Mitigation measure MM HZ-10b requires that all shoreline activities that could affect sediment (or in the case of the Navy-installed cover and riprap at Parcel E/E-2) be conducted in accordance with agency-approved remedial design documents, applicable health and safety plans, DCPs, or any other documents or plans required under applicable law or laws, including but not limited to applicable requirements shown in Table III.K-2. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts. For Candlestick Point, impacts would be mitigated through mitigation measures MM HY-1a.1 and MM HY-1a.2. With implementation of these mitigation measures, along with applicable regulations and permits, potential impacts related to exposure to hazardous materials releases from contaminated sediments that could be disturbed during proposed shoreline improvements would be reduced to a less-than-significant level for the Tower Variant, the same as for the Project.

Similar to the Project, remediation activities conducted on behalf of the City or developer in conjunction with development activities at HPS Phase II parcels transferred prior to completion of remediation in an "early transfer" would disturb soil and/or groundwater that may contain contaminants from historic uses. The identified mitigation measure (MM HZ-12) would require the SFDPH to ensure that before

development occurs, the Agency or the developer and their contractors have incorporated all applicable requirements into remedial design documents, work plans, health and safety plans, DCPs and any other document or plan required under the AOC or other applicable law, as a condition of development. As a result of these controls and mitigation measure, the potential impact of exposure to hazardous materials during remediation activities conducted on behalf of the Agency or the developer in conjunction with development of HPS Phase II under the Tower Variant would be reduced to less-than-significant levels.

In addition to uncovering hazardous materials within the existing buildings, construction and grading activities associated with the Tower Variant could disturb soil or rock that is a source of naturally occurring asbestos, which could present a human health hazard. As discussed in the paragraph above, a Tower Variant would slightly increase in the amount of excavation and ground disturbance, as compared to the Project. However, with the implementation of mitigation measure MM HZ-15, which requires preparation of an asbestos dust mitigation plan, this impact would be reduced to a less-than-significant level, similar to the Project.

As with the Project, the Bret Harte Elementary School and Muhammad University of Islam elementary school are located within one-quarter mile of the development area of the Tower Variants. Consistent with the discussion above, the Tower Variants could uncover asbestos-containing materials (naturally or in existing building materials) or other hazardous materials during construction, consistent with the Project. However, with incorporation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, and MM HZ-15, any impacts to these schools would be reduced to a less-than-significant level, similar to the Project.

After development of a Tower Variant, periodic maintenance could require excavation of site soils to maintain or replace utilities, repair foundations, or make other subsurface repairs, which could expose hazardous materials. As the total amount of development would be the same as the Project, the frequency of maintenance would be the same as the Project. Implementation of mitigation measures MM HZ-1a and MM HZ-1b would require remediation of any contaminated soils pursuant to the appropriate regulations. MM HZ-2a.1 would require the development of an unknown contaminant contingency plan to describe procedures to follow in the event unexpected contamination is encountered during construction activities, including procedures for ensuring compliance with the above laws and regulations. Additionally, mitigation measure MM HZ-2a.2, would require the preparation and implementation of a site-specific HASP in compliance with federal and state OSHA regulations and other applicable laws. The general requirement of mitigation measure MM HZ-9 would require that the Agency or its contractor or Project Applicant shall comply with all requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent for any properties subject to early transfer (prior to full Navy remediation). To reduce this impact related to exposure to hazardous materials releases that have not been fully remediated at HPS Phase II. Mitigation measure MM HZ-9 also requires that all work on the Yosemite Slough bridge would comply with Navy work plans for construction and remediation on Navy-owned property. Implementation of these mitigation measures would reduce this impact to a less-than-significant level, same as for the Project.

After construction, land uses anticipated under a Tower Variant would involve the routine use, storage, transportation, and disposal of hazardous materials. None of the additional residential towers proposed for inclusion in the Tower Variants would utilize hazardous materials other than routine maintenance and cleaning products typically used in residential and commercial settings. The Tower Variant would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of

hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, the same as for the Project. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. The Tower Variant would comply with applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials. Impacts would be less than significant, similar to the Project.

Hazardous materials would routinely be transported to, from, and within the Project site, and small amounts of hazardous waste would be removed and transported off site to licensed disposal facilities. Compliance with applicable regulations would ensure impacts are less than significant. Since essentially the same amount of development would occur under the Tower Variant and the Project, impacts would be similar to the Project.

Daily operations under the Tower Variant could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but this would not pose a human health risk and/or result in an adverse effect on the environment. Impacts would be less than significant, similar to the Project.

The Tower Variant site is not located within the San Francisco Airport Land Use Policy Plan Area or other airport land use plan, and a Tower Variant would not result in a safety hazard from airport operations for people residing or working in the area. The Tower Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Similar to the Project, operation of the Tower Variant would not expose people or structures to a significant risk of loss, injury, or death involving fires or conflict with emergency response or evacuation plans.

Geology and Soils

The footprint of development for a Tower Variant would be the same as for the Project, although the construction of an additional residential tower could slightly increase the extent of ground disturbance associated with excavation for the tower foundation. As such, impacts from construction of a Tower Variant would be similar to the Project. As the footprint of development, the total amount of development, and land uses would be the same as the Project, operational impacts from geology and soils would be the same as the Project.

Construction

As with the Project, construction activities, such as grading and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. The erosion hazard rating for the local soils in the Project site is slight to severe. Requirements to control surface soil erosion during and after construction with a Tower Variant would be implemented through the requirements of mitigation measure MM HY-1a.1 (SWPPP) and

adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, would be avoided or reduced to a less-than-significant level, similar to the Project.

In addition to the potential for soil erosion, construction activities would have the potential to affect groundwater levels. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by mitigation measure MM GE-2a (dewatering), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, a Tower Variant would result in a less-than-significant impact, similar to the Project.

At the Alice Griffith Public Housing site and the Jamestown area, the removal of bedrock through heavy equipment methods or controlled rock fragmentation activities would have the potential to fracture rock adjacent to the excavation, thereby destabilizing it and possibly causing settlement of structures above it. With implementation of those techniques, ground surface and building damage monitoring, as specified in the SFBC and required by mitigation measure MM GE-3, vibration from controlled rock fragmentation in the area would not cause unacceptable settlement or damage at adjacent or nearby properties would occur. Consequently, settlement hazards related to controlled rock fragmentation would be less than significant, similar to the Project.

Operation

Impacts with respect to geology and soils conditions with a Tower Variant would be substantially similar to those of the Project.

The potential for exposure to adverse effects caused by seismic groundshaking exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would require design-level geotechnical investigations that would include site-specific seismic analyses to evaluate the peak ground accelerations for design of a Tower Variant structures and the Yosemite Slough bridge, as required by the SFBC and Caltrans. Implementation of these mitigation measures would ensure that potential impacts from groundshaking would be less than significant, similar to the Project.

The potential for adverse effects caused by seismically induced ground failure such as liquefaction, lateral spreading, and settlement exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, and MM GE-5a would require design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of Variant structures, as required by the SFBC through review by DBI. It is anticipated that DBI would employ a third-party engineering geologist and/or civil engineer to form a GPRC. The GPRC would complete the technical review of proposed site-specific structural designs prior to building permit approval. The structural design review would ensure that all necessary mitigation methods and techniques were incorporated in the design for a Tower Variant foundations and structures to reduce potential impacts from ground failure or liquefaction a less-than-significant level, similar to the Project.

With a Tower Variant, the potential for adverse effects due to seismically induced landslides exists at the Project site. Implementation of mitigation measures MM GE-6a and MM GE-4a.2 would ensure compliance with the SFBC and any special requirements of the HUD for compliance documentation and would reduce potential impacts from landslides a less-than-significant level, similar to the Project.

With a Tower Variant, one or two tower locations would be different than proposed for the Project. Neither of these specific areas is located adjacent to the shoreline such that a Tower Variant could result in impacts greater than those discussed with the Project. Therefore, a Tower Variant would result in a less-than-significant impact due to shoreline stability, similar to the Project.

The potential for adverse effects caused by landslides exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual Tower Variant elements, as specified in mitigation measure MM GE-6a. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of this mitigation, a Tower Variant's impact with regard to landslides would be less than significant, similar to the Project.

The potential for adverse effects due to settlement exists at the Project site. However, design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-5a, MM GE-4a.2, and MM GE-4a.3 would ensure compliance with the provisions of the SFBC and would reduce the impact a less-than-significant level, similar to the Project.

The potential for adverse effects caused by expansive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-10a, MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to a Tower Variant structures from expansive soils a less-than-significant level, similar to the Project.

With a Tower Variant, the potential for adverse effects caused by corrosive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-11a, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Tower Variant structures from corrosive soils a less-than-significant level, similar to the Project.

Fault rupture hazards are unlikely. Ground rupture occurs most commonly along preexisting faults. No known active faults cross the Hunters Point shear zone, making hazards from fault rupture unlikely with a Tower Variant.[1275] Therefore, there would be no impact caused by surface fault rupture, similar to the Project.

All development with a Tower Variant would be connected to the City's existing wastewater treatment and disposal system and would not involve the use of septic tanks or alternative wastewater disposal systems. No impact would occur, similar to the Project.

A Tower Variant would not substantially change site topography or affect unique geologic features, and would have no impact on such features, similar to the Project.

[1275] GTC, 2005.

Hydrology and Water Quality

The footprint of development for a Tower Variant would be the same as for the Project, although the construction of an additional residential tower could slightly increase the extent of ground disturbance associated with excavation for the foundation of the additional tower. As such, impacts from construction of a Tower Variant would be similar to the Project. As the footprint of development, the total amount of development, and land uses would be the same as the Project, operational impacts to hydrology and water quality would be the same as the Project.

Construction

With adherence to applicable regulatory requirements, construction activities associated with a Housing Variant would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With additional excavation for building foundations, impacts would be greater than the Project. With implementation of mitigation measures MM HY-1a.1 (preparation of a SWPPP for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

No streams or rivers are currently located within the Tower Variants area and thus no streams or rivers would be altered by construction activities. During construction of a Tower Variant, the existing drainage patterns within the area would generally be preserved. Construction activities associated with a Tower Variant would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on site or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated a Tower Variant, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of a SWPPP), impacts would be less than significant, similar to the Project.

Operation

Operation of the Housing Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, this variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required

by implementation of mitigation measure MM HY-a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As the footprint of development, land uses, and extent of impervious surfaces would be the same for the Tower Variants as the Project, impacts would be similar to the Project.

Implementation of a Tower Variant would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of a Tower Variant could alter the existing drainage pattern of the site, but would not alter the course of an existing stream or river or result in substantial erosion, siltation, or flooding on-site or off-site, similar to the project. Implementation of a Tower Variant would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of a Tower Variant would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce impacts to a less-than-significant level, similar to the Project.

Implementation of a Tower Variant would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, the Tower Variants would not expose people or structures to inundation by seiche, tsunami, or mudflow. Impacts would be less than significant, similar to the Project.

Biological Resources

The footprint of development for a Tower Variant would be the same as for the Project, and the area subject to ground disturbance would be the same as the Project. As such, impacts to Biological Resources from construction of a Tower Variant would also be the same as the Project. As the footprint of development, the total amount of development, and land uses would be the same as the Project, operational impacts to biologic resources would also be the similar to the Project.

Construction

Development of a Tower Variant would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, and no impact would occur, similar to the Project.

Construction activities under a Tower Variant would not have a substantial adverse effect, either directly or through habitat modifications, on any common species or habitats of fish, wildlife, or birds due to interference with migratory movement. Impacts would be less than significant, and as the same area would be subject to construction activities as the Project, impacts would be similar to the Project.

Construction activities associated with a Tower Variant would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or United States Fish and Wildlife Service (USFWS), and no impact would result, similar to the Project.

Construction activities associated with a Tower Variant could have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means. Implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2 would reduce this impact to a less-than-significant level. As the same area would be subject to construction activities as the Project, impacts would be similar to the Project.

Construction activities associated with a Tower Variant could have a substantial adverse effect on eelgrass beds, a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. Implementation of mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce this impact to a less-than-significant level, similar to the Project.

Construction activities associated with a Tower Variant could have a substantial adverse effect, either directly or through habitat modifications, on any bird species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Implementation of mitigation measures MM BI-6a.1 and MM BI-6a.2 would reduce this impact to a less-than-significant level, similar to the Project.

Similar to the Project, the Tower Variant's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b would be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur. Therefore, a net increase in the quality of raptor foraging habitat would result, similar to the Project, and, with mitigation, the overall effect on raptors is expected to be beneficial.

Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved

construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring.

Construction activities could impact designated critical habitat for green sturgeon and Central California Coast steelhead; however, compensatory mitigation for lost aquatic habitat as described in mitigation measures MM BI-4a.1 and MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Overall adverse effects would be less than significant, similar to the Project. Mitigation measures MM BI-4a.1, MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would reduce potentially significant impacts to Essential Fish Habitat to less-than-significant levels, similar to the Project.

Construction activities associated with a Tower Variant would not have a substantial adverse effect, either directly or through habitat modifications, on the western red bat, a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Impacts would be less than significant and as the same area would be disturbed by construction activities as the Project, impacts would be similar to the Project.

In-water construction activities associated with a Tower Variant would require the removal of hard substrates (docks, riprap, seawalls, pilings, etc.) used by native oysters, but would not have a substantial adverse effect, either directly or through habitat modifications, on this species. Impacts would be less than significant, similar to the Project.

Construction activities associated with a Tower Variant would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites. Impacts would be less than significant, similar to the Project.

In-water construction associated with a Tower Variant would not result in the disturbance of contaminated soil or the re-suspension of contaminated sediments that could have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Additionally, construction associated with a Tower Variant would not have a substantial adverse effect on a sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS. Impacts would be less than significant, similar to the Project.

Development of the Tower Variant would not conflict with the natural resource protection policies of the General Plan; however, it could result in the disturbance or loss of trees that are protected by the City's Urban Forestry Ordinance and Section 143 of the *Planning Code*. Mitigation measure MM BI-14a would ensure that development does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. With implementation of mitigation measures MM BI-14a and MM BI-7b, the Tower Variant would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, similar to the Project, and overall impacts would be beneficial.

Operation

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to oysters, and mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to oysters. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Development of the Tower Variant could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site (eelgrass beds). Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce effects on eelgrass by surveying for and avoiding this habitat. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating species to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers. As all three of the Tower Variants would include one additional residential tower, impacts would be slightly greater than the Project. However, implementation of mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of the Tower Variant would be consistent with the biological resources protection policies of the City of San Francisco General Plan, and with implementation of mitigation measure MM BI-14a, development would be constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of the Tower Variant would not conflict with any local policies or ordinances protecting biological resources, and there would be no impact.

Public Services

Construction

Police and Fire Services

Similar to the Project, access to a Tower Variant site during construction would be maintained by implementation of a construction management traffic plan (CMTP) MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the area would be implemented.

Similar to the Project, construction of a Tower Variant would not result in increased demand on police protection services, as demands on the SFPD during construction would be supplemented by private security (as required by mitigation measure MM PS-1 [site security measures during construction]), and construction areas would be secured through the installation of fencing and gates.

Therefore, a Tower Variant would result in a less-than-significant impact to police protection and fire services during construction. As construction of a Tower Variant would not impact SFPD or SFFD response times upon implementation of a CMTP. These impacts would be similar to the Project.

Schools and Library Facilities

Construction of a Tower Variant would not result in impacts to the SFUSD or the San Francisco Public Library System. SFUSD or library facilities are not located on the Project site. All area school and library services would be available to the community throughout the duration of a Tower Variant construction. As such, since construction of a Tower Variant would be similar to construction of the Project, no impact to school or library services during construction of a Tower Variant would occur. These impacts are the same as those identified for the Project.

Operation

Police Protection Services

Development with a Tower Variant would have similar impacts to police protection services as development with the Project. Therefore, since operational impacts to police protection services were found to be less than significant for the Project, impacts to police protection services for a Tower Variant would also be less than significant.

Fire Protection Services

Development with a Tower Variant would have similar impacts to fire services as development with the Project. Therefore, since operational impacts to these services were found to be less than significant for the Project, impacts to these services for a Tower Variant would also be less than significant.

Building Safety

All new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help minimize demand for future fire protection services. Plan review of all structures for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services.

Response Time

Construction of a new SFFD facility on land designated for community serving uses on the Project site, along with the provision of additional firefighters and on-going fire protection operations, would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. The Applicant has designated 5.3 acres of community-serving uses in HPS Phase II, including 0.5 acre of which have been designated for a new SFFD facility.

These uses have been anticipated as part of a Tower Variant and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Variant. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including

Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[1276] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. Therefore, similar to the Project, the development of a Tower Variant would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is less than significant.

Schools

Operational impacts to schools would be similar to the Project because the number of dwelling units anticipated would be the same. Therefore, the number of school aged children that would require adequate school services would be the same as with the Project. Impacts from a Tower Variant on schools would be less than significant, similar to the Project.

Library Facilities

Operational impacts to libraries would be similar to the Project because the same number of dwelling units anticipated would be the same. Therefore, the service population for the existing library facilities would be the same as with the Project. Similar to the Project, library branches that currently serve the area including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Therefore, a Tower Variant would result in a less than significant operational impact to library services, similar to the Project.

Recreation

As the amount of open space and parks, the total amount of development, and the land uses provided with a Tower Variant would be the same as the Project, impacts to recreation would also be similar to the Project. This Variant, like the Project, would provide approximately 336.4 acres of parks and open space.

Construction impacts related to recreational facilities would be the same as those identified with the Project because the construction activities would be the same. The Tower Variant would have the same number of housing units as proposed with the Project, thereby resulting in the same residential population of 24,465. Operational impacts are determined based on a ratio of acres of parkland per resident. Currently, the City provides approximately 7.1 acres of parkland per thousand residents, and the standard used in Section III.P assumes a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet the demand

[1276] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. The parkland-to-population ratio associated with the Tower Variant would be 13.7, which is the same as the Project. The Tower Variant ratio would be considerably higher than the ratio of 5.5 acres of parkland per thousand residents, which is considered sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. Impacts would be less than significant.

The timing of Tower Variant development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities. The conceptual development plan for this Variant would result in the development of residential units and parks during all of four stages of development. Table III.P-3 (Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the Tower Variant). As this table indicates, the park-to-population ratio would not drop below 13.8 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population. Adequate parkland would be provided during each stage of development.

However, during a given phase, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed, and a less-than-significant impact would result.

A Technical Memorandum was prepared to study wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes development at the Project site (even if under the Tower Variant), generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). Because this Variant is the same as the Project in terms of development amounts and locations, it would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

In summary, impacts resulting from the Tower Variant would be substantially similar to the Project.

Utilities

As the footprint of development, the total amount of development, and the land uses provided with a Tower Variant would be the same as the Project, utility impacts for a Tower Variant would also be similar to the Project.

Water

As with the Project, beginning in 2025, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with a Tower Variant. With the implementation of the WSAP and RWSAP during multiple dry-year periods, which could include voluntary rationing or other water conservation strategies, existing and projected future water supplies could accommodate estimated future water demand, including the Project-related demand. As discussed in the WSA, the SFPUC has approved and has made substantial progress towards the implementation of the water facility improvement projects identified in the WSIP. The SFPUC has received voter approval to fund the Phased WSIP program and has initiated bond sales to fund implementation of individual projects, which are in various stages of implementation, including subsequent environmental review, design, or construction.[1277] Thus, there is substantial evidence that the SFPUC would implement the Phased WSIP facility projects described above, including the local water supply projects.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects, and various conservation efforts. The proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco.[1278,1279] Recycled water will primarily be used for landscape irrigation, toilet flushing, and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project is expected to begin environmental review in late 2009 or early 2010. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project. The local water supply improvement projects were approved as part of the Phased WSIP and are included in the WSIP funding program. The SFPUC has initiated planning, environmental review, and design of several recycled water and groundwater projects and conservation programs are in place. Thus, there is substantial evidence that the additional water provided by those projects would be available to supplement retail water supplies.

As noted above, the SFPUC adopted the Phased WSIP, which phased implementation of the water supply program to provide an additional 20 mgd of supply to meet projected demand through 2018 and requires the SFPUC to re-evaluate water demands and water supply options by December 31, 2018 through 2030 to meet projected demand. The Tower Variant would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, and this impact is less than significant, similar to the Project.

[1277] Per the *Water System Improvement Program Quarterly Report, Q4, FY 2008/2009* (dated August 20, 2009), (prepared by the SFPUC), as of July 1, 2009, two (2) projects are in the Planning Phase, eleven (11) projects are in the Design Phase, six (6) projects are in the Bid and Award Phase, five (5) projects are in the Construction Phase, two (2) projects in the Close-Out Phase, eight (8) projects are completed, one (1) project has not been initiated, and eleven (11) projects have multiple active phases. Available at: http://sfwater.org/Files/Reports/01_RW_Program_Summary.pdf Accessed September 28, 2009.
[1278] San Francisco Planning Department, Final Program Environmental Impact Report, Water Supply Improvement Program, October, 2008.
[1279] SFPUC, Urban Water Management Plan, 2005.

Wastewater

Wastewater generated by a Tower Variant would be discharged to the Combined Sewer System operated by the SFPUC. As the additional wastewater flows could be accommodated within the existing treatment capacity of those facilities, no expansion of existing wastewater conveyance or treatment facilities would be required and impacts would be less than significant. With the Tower Variant, Candlestick Point would no longer contribute stormwater or wastewater to the Combined Sewer System, similar to the Project. Implementation of a Tower Variant would not exceed the wastewater treatment requirements of the applicable Regional Water Quality Control Board, and a less-than-significant impact would occur. As the same amount of development would occur with a Tower Variant as with the Project, wastewater generation would be the same, and operational impacts associated with wastewater would be less than significant, similar to the Project.

Solid Waste

Construction of a Tower Variant, including demolition of existing facilities, would generate additional solid waste that may not be able to be accommodated by landfills serving the City of San Francisco. Implementation of mitigation measure MM UT-5a (Construction Waste Diversion Plan), which would require preparation of a construction waste diversion plan, would reduce impacts to a less-than-significant level. Construction of a Tower Variant could require the disposal of hazardous wastes such as lead-based paint, asbestos, and contaminated soils. However, this construction waste would not exceed the capacity of transport, storage, and disposal facilities permitted to treat such waste, and impacts would be less than significant. As the same amount of construction would occur with a Tower Variant as with the Project, construction-period solid waste impacts would be similar to the Project.

Operation of a Tower Variant would generate additional solid waste that may not be able to be accommodated by landfills serving the City of San Francisco. Implementation of mitigation measure MM UT-7a (Solid Waste Management Plan) would reduce impacts to a less-than-significant level. Operation of a Tower Variant would not generate solid waste that would exceed the permitted capacity of transport, storage, and disposal facilities authorized to treat such waste, and impacts would be less than significant. Implementation of a Tower Variant would comply with federal, state, and local statutes and regulations related to solid waste, and impacts would be less than significant. As the same amount of development and the same land uses would occur with a Tower Variant as with the Project, operational impacts to solid waste would be similar to the Project.

Electricity, Natural Gas, and Telecommunications

The proposed improvements within the Project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. The power supplier may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into HPS Phase II. This could include a new substation within the Project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the Tower Variant, similar to the Project.

Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR. The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for the Tower Variant, similar to the Project.

Energy

As the footprint of development, the total amount of development, and the land uses provided with a Tower Variant would be the same as the Project, energy impacts for a Tower Variant would also be the same as the Project.

Construction activities associated with a Tower Variant would require: electricity, for operation of hand tools, air compressors, mobile project offices, and security lighting; diesel, for fueling grading and construction equipment, delivery trucks, and earth hauling trucks; and gasoline, to fuel construction worker commute vehicles. Construction would consist of temporary activities that would not generate a prolonged demand for energy. Thus, energy consumption associated with construction activities would not be large in comparison to the Project, which is of a similar size and with similar land uses. Impacts would be less than significant, similar to the Project.

Operation of the Tower Variants would result in electricity and natural gas demand to operate the buildings and facilities; and petroleum usage associated with vehicle trips. These uses would increase the use of electricity and natural gas in the area, as well as consumption of petroleum; however, this would not be considered a wasteful use, and overall demand on the electrical grid would not be substantially increased. Impacts of a Tower Variant would result in a less-than-significant impact, similar to the Project.

Greenhouse Gas Emissions

The Candlestick Point Tower Variants A, B, and C would have the same GHG emissions as the project for both construction and operational emissions with the implementation of the mitigation measures. The emissions are shown in Table III.S-2 (Project Construction GHG Emissions) and Table III.S-3 (Project Annual GHG Emissions). Based on the less-than-significant conclusion for the Project, the Candlestick Point Tower Variants would all also be less-than-significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service

population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the Tower Variant and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO2e per service population per year and would result in a less-than-significant impact on climate change. The Tower Variant would not measurably change the parameters of the Project land use program, and thus this analysis applies to the Tower Variant.

IV.E VARIANT 4: UTILITIES VARIANT

IV.E.1 Overview

The Utilities Variant assumes the implementation of additional on-site utility infrastructure, including (1) district heating and cooling, (2) on-site wastewater treatment, and (3) an automated trash collection system. All land uses at Candlestick Point and the HPS Phase II site would be constructed at the same locations and at the same intensities proposed with the Project, although some minor shifts in building locations could occur to accommodate some elements of the proposed utility systems, which would require some additional built space.

IV.E.2 Project Objectives

The objectives for the Utilities Variant would be similar to the Project. In particular, the Utilities Variant was prepared to address the following from Objective 4:

- The integrated development should incorporate environmental sustainability concepts and practices, and in so doing should:
  - > Apply sustainability principles in the design and development of public open spaces, recreation facilities, and infrastructure including wastewater, storm water, utility, and transportation systems
  - > Incorporate green building construction practices
  - > Include energy efficiency and the use of renewable energy

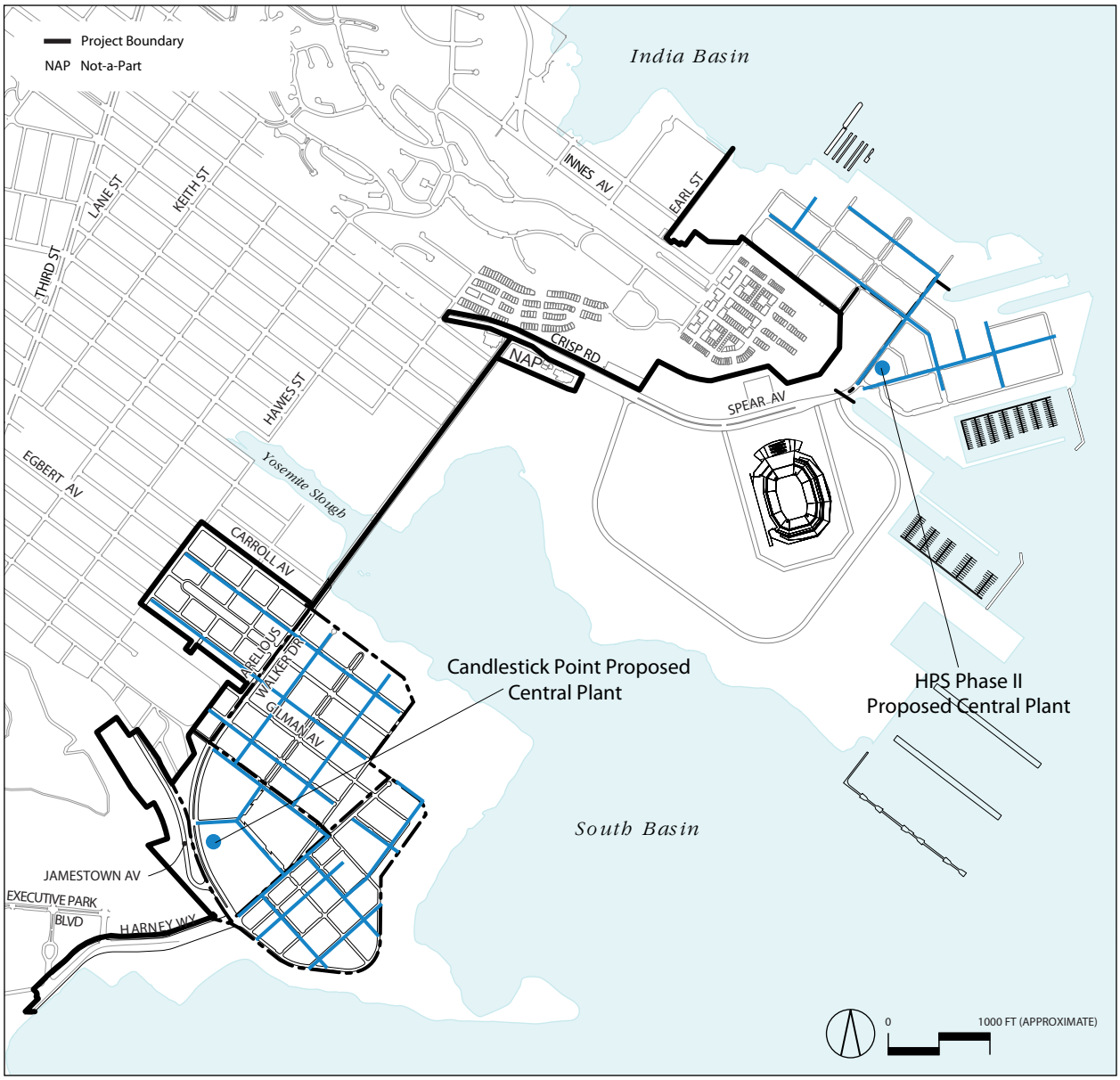
A full list of Project objectives is provided in Section II.D of this EIR.

IV.E.3 Characteristics

Section II.E outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. While each of these components of the Project would also apply to this variant, the additional infrastructure described herein would be in addition to that base description.

District Heating and Cooling

For this variant, heating and cooling would be provided from a centralized plant, instead of individual systems in each building or facility. One heating and cooling (district) plant would serve Candlestick Point and a second district plant would serve Hunters Point, with hot water (or steam) and chilled water distributed from the district plant to individual buildings via a pipe distribution network located under the streets (refer to Appendix T1 [District Plant Description]). The district plant serving Candlestick Point is proposed to be located within the parking structure adjacent to the regional retail center, while the district plant serving Hunters Point is proposed to be located within the parking structure adjacent to the R&D facilities (refer to Figure IV-21 [Utilities Variant Location of District Heating and Cooling Plants]). Each district plant facility would be approximately 40,000 to 65,000 square feet (depending on the



SOURCE: Lennar Urban, 2009.

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FIGURE IV-21

UTILITIES VARIANT LOCATION OF DISTRICT HEATING AND COOLING PLANTS

equipment used), arranged on two floors of approximately 15 to 20 feet high, for a maximum development of approximately 130,000 square feet. The first story would contain the boilers, chillers, pumps and other ancillary equipment. The upper story (or roof) would include exhaust ducts and the cooling towers.

Heating is proposed to be provided by natural gas-fired boilers that could generate either steam or hot water, although the most likely medium for distribution would be low temperature hot water (e.g., less than 250 degrees Fahrenheit). Hot water would be distributed via electrically driven pumping systems in the pipe distribution network. (If steam is used, it would be distributed by taking advantage of the backpressure created as the steam cools, and thus a steam distribution system would not require pumps).

Cooling could be provided by several sources including natural gas-fired, steam-fired, or electrically driven chillers. The most likely and energy-efficient option would be to generate chilled water from multiple electrically driven chillers, with the heat that is extracted from the water (by the chillers) transferred to cooling towers (on the roof) where the heat is exhausted to the ambient air through evaporation.

Based on the land uses and amount of developed space proposed in each district, preliminary estimates of the heating and cooling capacities for each district plant are identified in Table IV-35 (Estimated Heating and Cooling Loads). The peak hot water flow capacity of the district plants would be approximately 5,000 gpm for Candlestick Point and approximately 10,000 gpm for Hunters Point. The peak chilled water flow capacity from the district plants would be approximately 25,000 gpm for Candlestick Point and approximately 30,000 gpm for Hunters Point.

Table IV-35 Estimated Heating and Cooling Loads

Load Type	*Candlestick Point*	*HPS, Phase II*	*Totals*[a]
Heating Load (kBtu/hr)	91,511	184,213	220,579
Cooling Load (tons)	14,090	11,822	20,730

SOURCE: Arup, *HP/CP—District Heating and Cooling Description*, August 20, 2009.
a: Diversity, or increased efficiency, has been applied to the totals.

Each building or customer would be provided with a point of connection to the hot and chilled water distribution loops. This point of connection would include meters from which the energy consumption of each service (heating or cooling) could be determined. Within the individual buildings, piping systems would distribute hot and chilled water to air handling units, which would distribute heated or cooled air to building spaces, based on the preferred air temperature set by occupant-controlled thermostats. (Note that proposed district-based systems would provide heated or cooled air only, as hot water would be generated by individual units.)

On-Site Wastewater Treatment

The Utilities Variant would modify the wastewater treatment system to collect and route wastewater flows to decentralized wastewater treatment plants located throughout the Project site, instead of collecting and conveying wastewater to the Southeast Water Pollutant Control Plant (operated by SFPUC) for treatment. Each decentralized wastewater treatment plant would be sized to accommodate approximately 100,000 gallons per day of wastewater. To accommodate the estimated Project-generated wastewater flow of approximately 1.1 mgd, eleven decentralized wastewater treatment plants would be needed, with seven

plants proposed to be located within Candlestick Park and four in Hunters Point, as shown in Figure IV-22 (Utilities Variant Location of Decentralized Wastewater Treatment Plants).

The wastewater treatment plants would use membrane bioreactors (MBRs) to treat wastewater, via a series of screens, anoxic and aerobic bioreactors (which remove solids and convert nitrogen and ammonia compounds), a membrane filter, and disinfection via exposure to ultraviolet light (refer to Appendix T2 [Decentralized MBR]). Sludge produced by the aerobic bioreactor would be held in a storage tank for periodic collection (e.g., once a week) and transport (via a truck) for recycling, composting, or disposal. The recycled water produced by the treatment plants would be distributed via separate plumbing systems for both exterior (e.g., water features, landscape irrigation) and interior uses (e.g., toilets and urinals). With approximately 1.1 mgd of anticipated wastewater flows, and assuming a 5 percent loss (via sludge disposal), the eleven decentralized plants would generate approximately 1.05 mgd of reclaimed water.[1280]

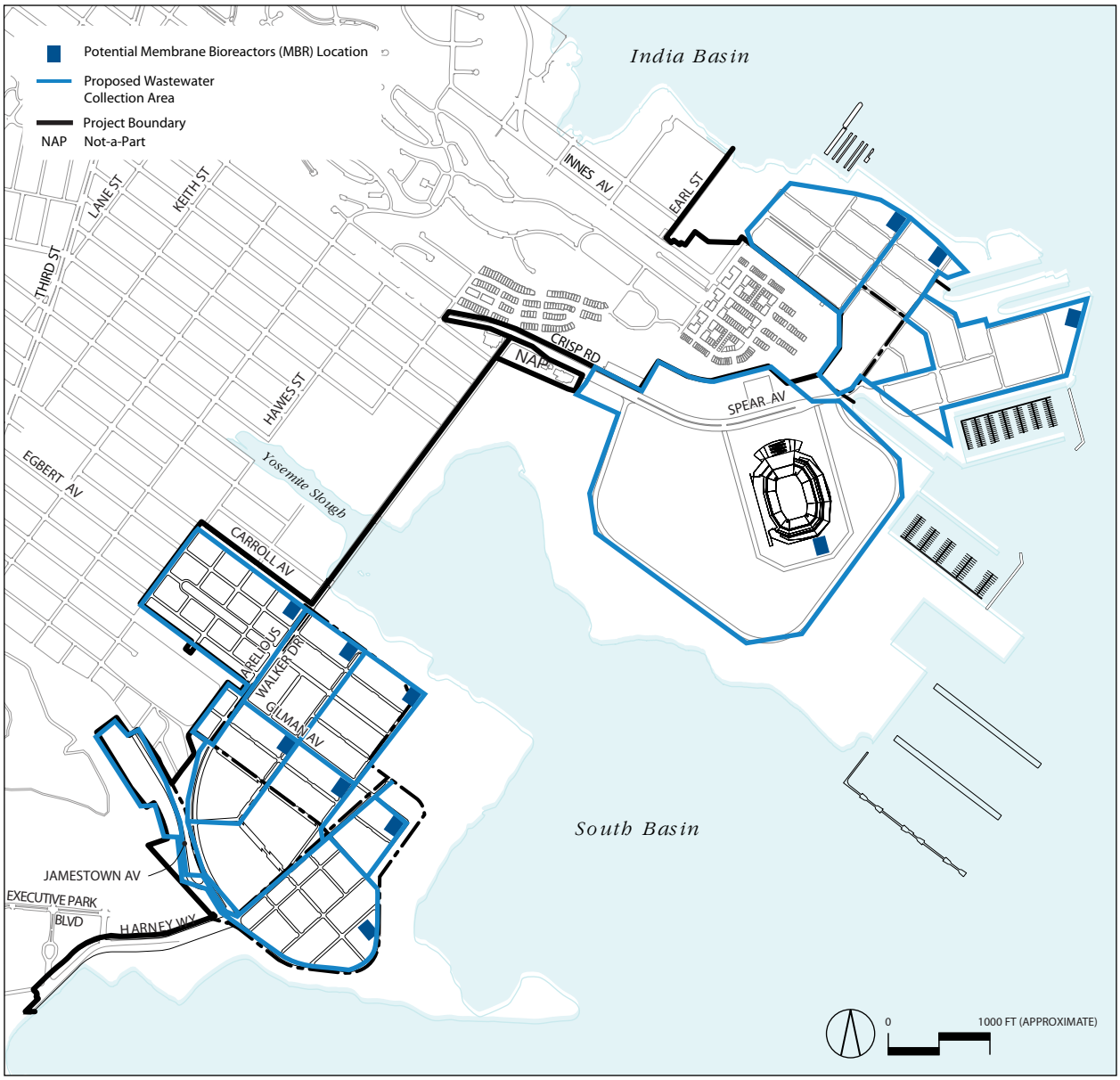
A sludge-holding tank would be used to store sludge, which typically has a water content of about 70 percent, prior to removal. Each wastewater treatment plant would produce about 25 cubic feet or 1,115 pounds (lbs) of wet weight sludge per day. The sludge holding tank would have a storage volume of approximately 175 cubic feet or 6 cubic yards, which could store up to one week of sludge production. Assuming 11 treatment plants, approximately 3,432 cubic yards[1281] of sludge would be generated annually, with a wet weight of approximately 2,238 tons.[1282]

Each wastewater treatment plant would require approximately 6,250 square feet of aboveground footprint to house the treatment plant components, pumps, and chemical storage area. Wastewater, recycled water, and sludge storage tanks could be located below ground (e.g., under parking spaces or driveways) to reduce the footprint of the facility. The estimated belowground footprint requirement for each facility would be approximately 30,000 square feet. Thus, each plant would require approximately 36,250 square feet and the proposed eleven plants would occupy approximately 400,000 square feet.

Automated Trash Collection System

This Variant would provide an automated trash collection system, which would transport trash from individual buildings and collection points and transfer it, via underground pneumatic tubes, to a centralized collection facility, from which solid waste, recyclable materials, and compostable materials would be removed via trucks (refer to Appendix T3 [System Overview]). This automated system would replace the trash and recycling bins at individual buildings with two centralized facilities, one in Candlestick Point and another at Hunters Point (refer to Figure IV-23 [Utilities Variant Location of Centralized Solid Waste Collection Facilities]).

[1280] Arup, MBR Decentralized Wastewater Treatment, EIR Description, August 19, 2009.
[1281] Calculated as 11 treatment plants generating 6 cubic yards per week: 11 plants X 6 yds^3 X 52 weeks = 3,432 yds^3/year.
[1282] Calculated as 11 treatment plants generated 1,115 lbs/day: 11 plants X 1,115 lbs/day X 365 days = 2,238 tons/year.



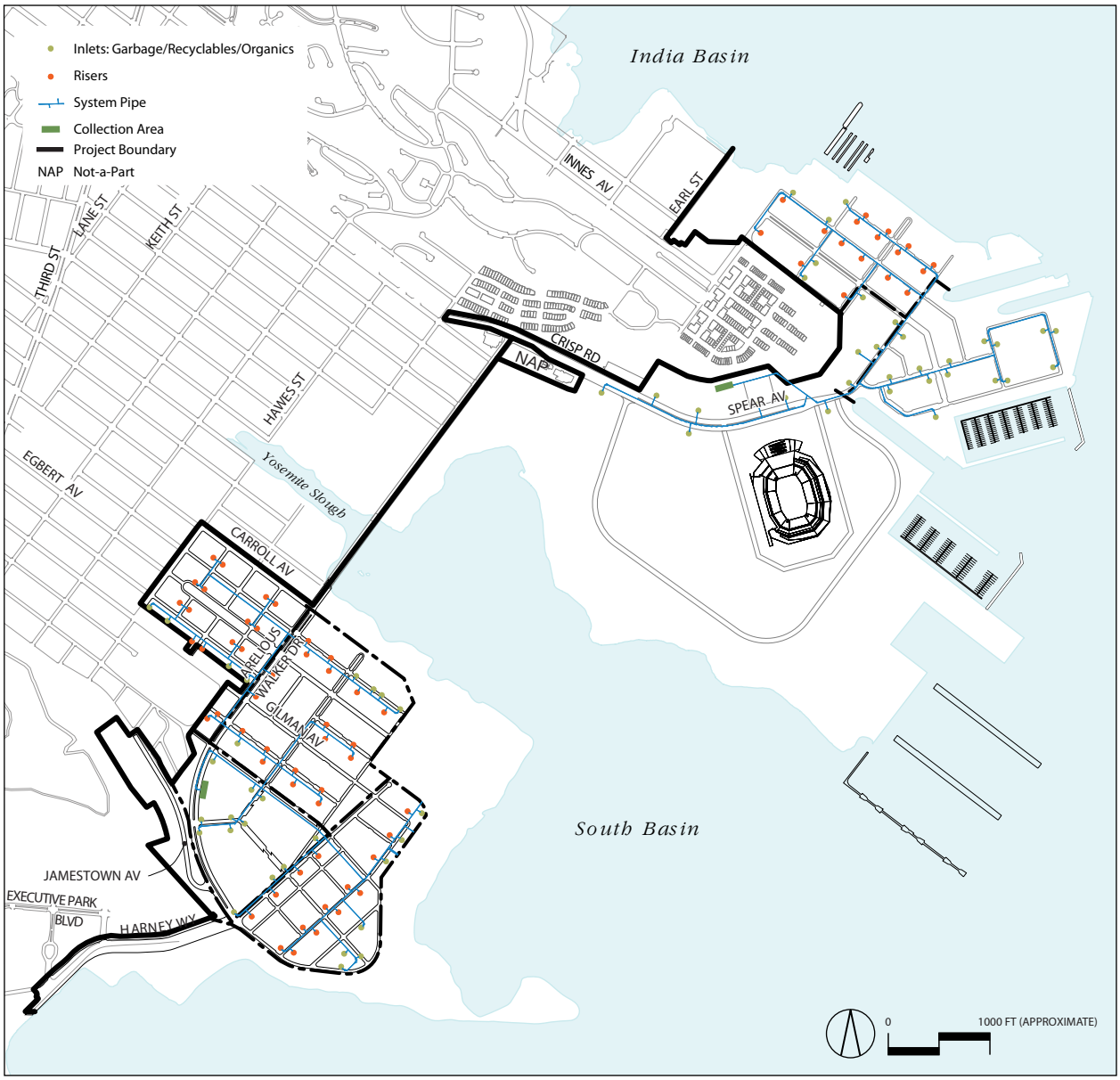
SOURCE: Lennar Urban, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

FIGURE IV-22

UTILITIES VARIANT LOCATION OF DECENTRALIZED WASTEWATER TREATMENT PLANTS



SOURCE: Lennar Urban, 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

FIGURE IV-23

UTILITIES VARIANT LOCATION OF CENTRALIZED SOLID WASTE COLLECTION FACILITIES

The proposed automated waste collection system would permit the on-site source separation of recyclables, compostables, and trash, and the introduction of those materials into separate collection points (e.g., trash chutes), which would be located at ground level and on each floor of the multi-story buildings (or in a common area for a group of single-family homes). Once deposited, the material would be temporarily stored at the loading point, and periodically transferred (via an underground pipe network located within roadways) to a central waste handling facility, via a 60 mph air stream within the transport pipes. The discharge of materials into the underground transport pipe network would occur on a regularly scheduled basis, although a sensor in the temporary storage space would initiate the discharge sequence when the level of materials reaches the capacity of the storage space. At the central waste handling facility, each type of material would be deposited into separate containers for compaction before being transported off site via trucks. With this system, solid waste trucks would not visit individual buildings to collect solid waste, recyclable, and compostable materials, but instead would travel to the two centralized facilities to collect these materials.

The two central waste handling facilities would each house fan units, air scrubbers (to minimize odors), cyclone waste separators (to enhance separation of materials), compactors (to reduce the volume of materials), and 40 cubic yard containers. Once filled, the containers would be moved to a staging location within the facility to await removal by truck and an empty container would be quickly moved into place and connected to the compactor. Each central waste handling facility would be approximately 15,000 to 20,000 square feet and about 35 feet in height, for a maximum of approximately 40,000 square feet.[1283] The facilities could be located completely or partially underground, below a building or parking deck. Sound insulation would be provided around the fan and/or collection area to minimize ambient noise from the facility. Air exhaust from the facilities would be scrubbed prior to discharge, by forcing the exhaust air to pass through a screen of water that removes particles and provides odor neutralization. The scrubber water would be filtered and recycled.

IV.E.4 Potential Environmental Effects

Overall, the Utilities Variant would increase the total amount of development compared to the Project due to an increase in the amount of square footage allocated to utilities. Two district heating and cooling plants, approximately 40,000 to 65,000 square feet each, would be developed, reducing the amount of infrastructure that would need to be included within individual buildings. It is assumed that the size of individual buildings would slightly decrease (because less mechanical equipment would be needed), and thus the amount of total new space associated with heating and cooling systems would be essentially the same. The inclusion of decentralized wastewater treatment plants would increase the amount of built space by approximately 400,000 square feet, assuming the inclusion of eleven decentralized MBR treatment facilities, each approximately 36,250 feet in size. However, approximately 30,000 square feet of each facility would be located underground effectively reducing the new development associated with the MBR facilities (from a pedestrian standpoint) to 68,750 square feet.[1284] The inclusion of the automated solid waste collection system would result in the development of two central waste collection facilities, each approximately 15,000 to 20,000 square feet in size, for a total of approximately 40,000 square feet. As these

[1283] TransVac Systems, CP-HPS System Overview, August 18, 2009.
[1284] 6,250 square feet of above ground development for each of the eleven MBR facilities.

facilities would eliminate the inclusion of solid waste receptacles (and compaction equipment) within individual buildings, it is assumed that the total amount of space attributed to the collection, storage and compaction of solid waste could be greater than the more standard methods of collection, such as dumpsters within each building. Thus, this Variant would increase the total amount of built space by approximately 568,750 square feet.

The Utilities Variant would include underground distribution systems such as pipes and pumps, located underneath the streets within the Utilities Variant area, similar to the Project. The number of underground systems would increase with development with this Variant, as hot water, chilled water, and three separate waste collection systems (for solid waste, recyclables, and compostables) would be provided. Storage tanks associated with the decentralized wastewater treatment plants are proposed to be located underground. Compared to the Project, the Utilities Variant would increase the extent of underground construction, with additional underground utility systems located within the street network and storage tanks located beneath the wastewater treatment plants.

Thus, the potential construction-related environmental effects of the Utilities Variant would be related to an increase in the amount of total building space, approximately 568,750 square feet, of which approximately 330,000 square feet would be below-grade, and an increase in the extent of underground construction (from additional utility systems located beneath the street network and the underground storage space for the wastewater treatment plants).

The potential operational effects of the Utilities Variant would be related to operation of district heating and cooling plants, the decentralized wastewater treatment plants, and the automated solid waste collection system.

Land Use and Plans

Development of the Utilities Variant would be substantially similar to the Project and would not physically divide an established community or conflict with plans, policies, or regulations adopted to avoid or mitigate an environmental effect. Operation of the Utilities Variant would alter the existing land use character of the vicinity, but such an alteration would not be adverse, similar to the Project. The Utilities Variant would include approximately 568,750 square feet of additional space, when compared to the Project, to accommodate the heating and cooling plants, the wastewater treatment plants, and the solid waste collection system. Notably, approximately 330,000 square feet of this total would be constructed below ground, thereby reducing potential impacts. Therefore, construction proposed above-ground with the Utilities Variant includes approximately 15 new buildings, the tallest of which would be 35 feet in height, and the largest of which would be approximately 40,000 to 65,000 square feet (the heating or cooling plants). This development is consistent with uses and building characteristics proposed with the Project. Therefore, these additional structures would not result in an adverse change to the land use character of the site or the surrounding areas, and the Utilities Variant would result in a less-than-significant impact, similar to the Project. The Utilities Variant would result in an urban development replacing deteriorating industrial and open space, similar to the Project, and would not conflict with existing land use plans. Thus, potential impacts of the Utilities Variant to land use and plans would be less than significant, similar to the Project.

Population, Housing, and Employment

As discussed in the introduction, the Utilities Variant includes the development proposed with the Project plus the addition of substantial infrastructure, including a subterranean piping network, new heating and cooling towers, new wastewater treatment facilities, and relocated/redesigned solid waste collection facilities. All impacts related to the inducement of substantial population growth (directly or indirectly) were found to be less than significant for the Project. The installation of additional infrastructure to better serve the proposed development would not result in the generation of substantial additional residents or employees in the area, in addition to what is anticipated with the Project. While some additional short-term employment opportunities may be made available during the construction period, these opportunities would be few and placement would be from the surrounding community.

Operation of the Utilities Variant, which would consist of the operation and maintenance of the proposed infrastructure improvements, would not result in the generation of a substantial number of people to the area. While operation of the Utilities Variant could induce population growth directly and/or indirectly, this growth would not be substantial and the Utilities Variant would result in a less-than-significant impact, similar to the Project. As with the Project, the Utilities Variant could temporarily displace existing housing units and residents at Candlestick Point, but construction of replacement housing would not be necessitated elsewhere. Thus, potential population, employment, and housing impacts of the Utilities Variant would be less than significant, and similar to the Project.

Transportation and Circulation

As is considered for the Project, under the Utilities Variant, the installation of additional infrastructure to better serve development would not result in the generation of additional residents or employees in the area that would result in additional traffic. All land uses at Candlestick Point and the HPS Phase II site would be constructed at the same locations and at the same intensities proposed under the Project, although some minor shifts in building locations could occur to accommodate some elements of the proposed utility systems, which would require some additional built space. Therefore, the Utilities Variant would not result in an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system, above what was analyzed for the Project. Furthermore, the Utilities Variant would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management plan (CMP) for roads or highways. Generally speaking, transportation impacts associated with the Utilities Variant would be the same as those identified for the Project.

The Utilities Variant site is not located within the San Francisco Airport Land Use Policy Plan Area or near a private airstrip. Therefore, the Utilities Variant would result in a less than significant impact to aircraft activity and traffic levels, similar to the Project.

The Utilities Variant includes the installation of a subterranean piping network, as well as approximately 15 new buildings to house the requisite utility functions. The subterranean development would not affect or increase hazards due to design features or incompatible uses above ground. The new buildings would be designed consistent with the SFBC which would reduce all potential design hazards to a less than significant level. Furthermore, the roadway network associated with both the Project and the Utilities

Variant would be designed to meet all applicable codes, including design guidelines for emergency access, and would result in a less than significant impact due to design hazards, similar to the Project.

The provision of a sophisticated utility system under the Utilities Variant would not substantially increase the number of residents or employees in the area. As such, substantial additional parking, above that considered for the Project, would not be required. Parking at the new buildings associated with the utilities including, but not limited to, the heating and cooling plants, the wastewater treatment facilities, and the solid waste collection facilities would be provided consistent with the requirements of the SFBC. Therefore, the Utilities Variant would result in a less than significant impact to parking, similar to the Project. As the Utilities Variant would not change the roadway design or alternative transportation plans analyzed for the Project, the Utilities Variant would comply with adopted policies and plans regarding alternative transportation and would result in a less than significant impact.

Aesthetics

Construction

Similar to the Project, construction activities associated with the Utilities Variant would generally include demolition (scraping and/or cutting) of existing asphalt and concrete, grading for roadways, roadway improvements, trenching for the proposed underground piping network, and construction of new buildings. Construction activities associated with the Utilities Variant would not have a substantial adverse effect on a scenic vista, scenic resources including, but not limited to, trees and rock outcroppings, or the visual character of the area. Construction activities may be seen from adjacent land uses, similar to the Project; however, these construction conditions would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Therefore, impacts to the visual character of the area would be less than significant, similar to the Project. While construction activities are taking place, appropriate security lighting would be utilized. However, this would be a temporary occurrence and lighting would be removed upon completion of construction. Therefore, the Utilities Variant would not create a new source of substantial light or glare that would adversely affect day or night views in the area or substantially adversely impact other people or properties. Mitigation measures MM AE-7a.1 through MM AE-7a.4, MM AE-7b.1, and MM AE-7b.2 would reduce lighting impacts to less than significant for this variant.

Operation

The Utilities Variant would result in approximately 15 new buildings on site including a variety of heating and cooling plants, wastewater treatment plants, and solid waste collection facilities. However, all of these buildings would have a height no greater than 35 feet. This is consistent with other development in the surrounding urban and developed area. Additionally, this height is consistent with, and lower than, the building heights proposed with the Project. As such, similar to the Project, the Utilities Variant would result in less-than-significant impacts to aesthetics due to the creation of impediments to views. Operation of the Utilities Variant would not remove or substantially block a scenic vista or scenic resources, including but not limited to trees and rock outcroppings. As such, operation of the Utilities Variant would result in less than significant aesthetic impacts, similar to the Project.

The Project would result in the generation of plumes of evaporated water at multiple locations throughout the Project site from the operation of evaporative cooling towers, particularly during cool, damp, or foggy weather. With the Utilities Variant, the plumes of evaporated water resulting from the heating and cooling plants would be consolidated and effectively relocated to two locations, rather than numerous smaller but scattered locations anticipated with the Project. These two new locations include the parking structure adjacent to the regional retail center at Candlestick Point, as well as the parking structure adjacent to the R&D facilities at Hunters Point (as depicted on Figure IV-21). These plumes would be most visible during cool, damp, or foggy weather. However, as clouds or fog would generally be present at those times, the concentration of evaporated water plumes would not substantially degrade the existing visual character or quality of the site and its surroundings, and this impact would be less than significant, similar to the Project.

Similar to the Project, the Utilities Variant would create new sources of light, including light emanating from parking areas and the 49ers stadium, which could be obtrusive in nearby residential areas. Each of the heating and cooling plants (one of each type), wastewater treatment plants, and central waste handling facilities would require appropriate operational and security lighting that could result in a greater number of lighting sources than the Project. However, these sources would not include substantially more (in number) sources than the Project. Furthermore, these lighting sources would be consistent with those anticipated with the Project, as well as those existing in the urban, developed area within which the Project and the Utilities Variant are proposed. Therefore, aesthetic impacts of the Utilities Variant due to new sources of lighting would be similar to the Project. Similar to the Project, implementation of mitigation measures MM AE-7b.1 (test field lighting) and MM AE-7b.2 (avoid spill lighting) would further reduce this impact to a less-than-significant level.

Thus, potential aesthetic impacts of the Utilities Variant would be less than significant, similar to the Project.

Shadows

The Utilities Variant would result in approximately 15 new buildings on site including a variety of heating and cooling plants, wastewater treatment plants, and solid waste collection facilities. However, all of these buildings would have a height no greater than 35 feet. This would be consistent with other development in the surrounding urban and developed area. Additionally, this height would be consistent with, or lower than, the building heights proposed with the Project. As such, the Utilities Variant would result in less-than-significant impacts of shadow effects on existing and proposed open space, similar to the Project,.

Wind

Development of the Utilities Variant would result in development that is similar to the Project, with the exception of 15 structures ranging in height from 15 to 35 feet. As none of these structures would exceed 100 feet in height, none would have the potential to generate winds that could affect pedestrian spaces as ground level. With the incorporation of mitigation measure MM W-1a (Building Design Wind Analysis), impacts would be reduced to a less than significant level, similar to the project.

Air Quality

The Utilities Variant would involve the development of additional on-site utility infrastructure. While construction of centralized utilities would result in a greater amount of development, most of the development would be underground, and the level of overall above-ground development with this alternative would be substantially similar to the Project, as shown in Table IV-1. Construction and operational impacts would be substantially similar to the Project.

Construction

As stated above, overall construction impacts of the Utilities Variant with respect to air quality would be similar to the Project. Construction activities would occur throughout the 702-acre site over the approximately 20-year build-out period ending in 2029 with Utilities Variant. Similar to the Project, construction activities with Utilities Variant would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures, use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. However, the BAAQMD does not recommend any significance thresholds for the emissions during construction. Instead, the BAAQMD bases the criteria on a consideration of the mitigation measures to be implemented. If all appropriate emissions mitigation measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, construction emissions are not considered adverse. Fine particulate matter (PM_{10}) is the pollutant of greatest concern with respect to construction activities. Any project within the City of San Francisco, including Utilities Variant, would be required to comply with San Francisco Health Code Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). As such, with implementation of mitigation MM HZ-15, which identifies specific mitigation measures that would be used to reduce emissions associated with construction, construction-related criteria pollutant impacts associated with Utilities Variant would be less than significant, similar to the Project.

With respect to airborne human health risks, construction activities associated with the Utilities Variant would increase the levels of two potential human health risks: (1) diesel particulate matter (DPM) and (2) dust or particulate matter (PM_{10}) bound to certain metals and/or organic compounds from on-site soils. MM AQ-2.1 (Implement Accelerated Emission Control Device Installation on Construction Equipment) and MM AQ-2.2 (Implement Accelerated Emission Control Device Installation on Construction Equipment Used for Alice Griffith Parcels) would address construction sources of DPM including off-road construction equipment such as lifts, loaders, excavators, dozers, and graders. In addition, the delivery of equipment and construction materials, spoils and debris hauling, and employee commute traffic could contribute to construction-related DPM emissions. In terms of DPM, ENVIRON prepared a human

health risk assessment (HRA)[1285] that evaluated potential human health risks associated with construction and operation of the Project. As construction emissions associated with the Utilities Variant are expected to be the same as those associated with Project, the Utilities Variant would have the same impacts than the Project, would not exceed the BAAQMD CEQA threshold. As the carcinogenic and non-carcinogenic health risks posed by DPM emissions during construction activities associated with development of the Utilities Variant have been determined to be below established thresholds, this impact is less than significant with MM AQ-2.1 and MM AQ-2.2, similar to the Project.

Similar to the Project, construction activities at both Candlestick Point and HPS Phase II for the Utilities Variant have the potential to generate TACs associated with soil-PM_{10} and an HRA evaluated the potential concentrations of the airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult and child residents, workers, and schoolchildren) in the Project vicinity. As the carcinogenic and noncarcinogenic health risks posed by soil-PM_{10} emissions during construction activities associated with development of the Project have been determined to be below established thresholds, the same impacts would be expected from the Utilities Variant. This impact is less than significant with MM HZ-15, similar to the Project.

Operation

The level of emissions anticipated with Utilities Variant would be the same as the Project; as such impacts to regional and local air quality would be substantially similar to the Project.

Both this variant and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. The Utilities Variant, similar to the Project, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land uses anticipated with Utilities Variant would be expected to exceed existing BAAQMD thresholds. Under BAAQMD's current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project, no additional feasible mitigation measures are available to reduce Utilities Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact.

With respect to airborne human health risks, emissions associated with operation activities under the Utilities Variant would increase the levels of two potential human health risks: (1) TACs and (2) vehicle emissions ($PM_{2.5}$).

This Utilities Variant continues to include R&D facilities at HPS Phase II, which are situated on a peninsula extending to the south of other proposed residential areas. As the predominant winds are out of the west, on-site receptors will generally be upwind from these R&D areas. As such, the Project is designed to minimize potential adverse impacts between TAC sources in R&D areas and both on-site and off-site receptors. As discussed for the R&D Variant, an analysis was conducted to determine the potential impacts

[1285] Environ. 2009. Ambient Air Quality Human Health Risk Assessment: Candlestick Point – Hunters Point Shipyard Phase II Development Plan. September 28. Appendices I & II.

from a variety of TAC sources in the R&D areas. Details regarding this assessment can be found in Appendix H1, Attachment III.[1286]

The HRA estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. All receptors were initially evaluated as residential receptors. The estimated excess lifetime cancer risks and HIs within areas designated for residential use were found not to exceed the BAAQMD's significance thresholds for carcinogenic and noncarcinogenic health risks. As the Utilities Variant has the same configuration as the Project, the estimated cancer risks for long-term residential exposure would be above 10 in one million in an area designated as open space that would extend slightly south beyond the R&D boundary. The maximum estimated cancer risk for a residential receptor in this location would be 17 in one million; the noncarcinogenic health risks would have an HI of 1.6. However, as noted above, this receptor location would be in an area designated as open space, and would not be a residential location. If cancer risks were estimated based on exposure assumptions consistent with recreational use of the open space, the risks would be reduced well below the threshold of 10 in one million. Due to the decrease in the frequency and duration of potential exposures, the chronic HI would also be reduced below the HI threshold of 1.0.

The estimated health risks would be below BAAQMD thresholds for all residential receptor locations as a result of implementation of the Project. As such, impacts would be less than significant with implementation of MM AQ-6.1 and MM AQ-6.2 developed for the Project and also required for the Utilities Variant.

In terms of human health risks associated with vehicle emissions, vehicle emissions along local roadways for the Utilities Variant (Variant 4) would remain unchanged from the Project. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the Utilities Variant (Variant 4) were estimated at selected roadways and compared against the 0.2 $\mu g/m^3$ action level to determine the potential health risks on receptors attributed to vehicle emissions from the Utilities Variant.

Several roadway segments were chosen based on whether Project-related traffic would use these streets to access neighboring freeways and other areas of San Francisco and/or currently or would experience significant truck traffic. The roadways chosen include:

- Third Street
- Innes Avenue/Hunters Point Boulevard/Evans Avenue
- Palou Avenue
- Gilman Avenue/Paul Avenue
- Harney Way
- Jamestown Avenue
- Ingerson Avenue

[1286] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

- With the addition of Variant-related traffic, no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of the 0.2 $\mu g/m^3$ action level.[1287] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

Noise and Vibration

As discussed in the introduction, the Utilities Variant includes the development proposed under the Project plus the addition of substantial infrastructure, including a subterranean piping network, new heating and cooling towers, new wastewater treatment facilities, and relocated/redesigned solid waste collection facilities. As the land uses provided with the Utilities Variant would be the same as the Project, with just the addition of additional utilities within the Project area, noise impacts of a Utilities Variant would also be the same as the Project.

Construction activities for a Utilities Variant would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the Utilities Variant, but not to a less-than-significant level as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a Utilities Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a Utilities Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a Utilities Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. Measures available to address significant traffic noise increases in these residential areas are limited. The ultimate feasibility and implementation of the noise insulation measures

[1287] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Appendix IV, May 4, 2010.

that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City as the lead agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable.

Football games and concerts at the proposed stadium with a Utilities Variant would generate noise that would adversely affect surrounding residents, similar to the Project. Implementation of mitigation measure MM NO-7.1 would ensure that nearby residential uses do not experience temporary increases in ambient noise levels within their homes that would exceed 45 dBA; however, as with the Project, the feasibility and practicality of mitigation measure MM NO-7.1 cannot be determined at this time, this impact would remain significant and unavoidable.

The Utilities Variant site is not located within an airport land use plan area or near a private airstrip. Furthermore, the Utilities Variant does not include an aviation component. Therefore, a Utilities Variant will not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources and Paleontological Resources

Construction

The footprint of development with the Utilities Variant would be substantially similar to the Project. As such, impacts anticipated to Cultural Resources including paleontological, archaeological, and historical resources as a result of construction of the Utilities Variant would generally be similar to the Project as well. With the Utilities Variant, additional utility systems would be located beneath the street network. This work would not substantially alter the land surface proposed for traffic and circulation as compared to the Project, and all areas anticipated for streets, sidewalks, and associated roadway infrastructure would already be assumed to be subject to grading and some excavation as part of the Project. The installation of underground storage space beneath the wastewater treatment plants (approximately 30,000 square feet per building) as well as the potential for increased excavation under the heating/cooling plants and solid waste collection facilities, as compared to the Project, would increase the extent of excavation in some locations. Similar to the Project, impacts associated with additional excavation for the Utilities Variant could result in significant impacts to paleontological and archaeological resources or result in the disturbance of human remains interred outside formal cemeteries. However, implementation of mitigation measures MM CP-2a (archaeological resources), MM CP-3a (paleontological resources), and MM CP-1b.1 and MM CP-1b.2 (historic resources) would reduce construction impacts to archaeological and paleontological resources to a less-than-significant level, similar to the Project.

Construction of the Project was determined to have a significant and unavoidable impact to historic resources due to the proposed demolition of buildings, structures, and objects associated with the area's "transition from early commercial dry dock operation to high tech naval repair and Radiological research and waste treatment facility."[1288] While the Project proposes to retain the buildings and structures in the potential Hunters Point Commercial Drydock District, identified in 1998 as eligible for listing in the NRHP, development would result in the demolition of buildings that have been determined eligible for

[1288] Circa Historic Property Development, *Hunters Point Commercial Dry Dock and Naval Shipyard Historic District DPR form*, October 31, 2008.

the CRHR and are contributors to the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. This would be a potentially significant impact because the proposed actions would demolish buildings that contribute to a historic district; the impact would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. With the Utilities Variant the same impacts would occur due to removal of the same structures discussed above. Installation of the heating/cooling towers, MRP buildings, and solid waste collection facilities, in addition to all associated infrastructure would not alter any additional structures that may be considered to contribute to the district. The Utilities Variant would comply with MM CP-3b (historical resources), which would reduce impacts to the extent feasible. However, the impact would not be fully reduced and the Utilities Variant would result in a significant and unavoidable impact with mitigation to historic resources during construction. This impact would be similar to that identified for the Project.

Operation

Operation of the Utilities Variant would result in less-than-significant impacts to cultural resources, including paleontological, archaeological, and historic resources, similar to the Project.

Hazards and Hazardous Materials

Construction activities associated with the Utilities Variant would disturb soil and/or groundwater; result in the handling, stockpiling, and transport of soil; involve demolition or renovation of existing structures that could include asbestos-containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury; expose construction workers to hazardous materials; be a source of hazardous air emissions within one-quarter mile of an existing or planned school; and encounter soils or groundwater that contains contaminants from historic uses that could pose a human health or environmental risk if not properly managed. Each of these impacts for the Utilities Variant would be similar to the Project and would be reduced to a less-than-significant level with implementation of the identified mitigation measures (MM HY-1a.2, MM HZ-1a, MM HZ1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM HY-1a.1, MM HY-1a.3, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4).

Construction of the Utilities Variant would require improvements to existing utility infrastructure and installation of new underground utilities, including hot and chilled water distribution lines as well as solid waste collection lines, which could expose construction workers, the public, or the environment to hazardous materials. This additional utility work could result in an increase in the amount of excavation and a slightly greater level of ground disturbance and excavation than the Project. However, with the implementation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, which require remediation of any contaminated soils, the hazards risk from potential exposure to contaminated soil or groundwater during construction would be reduced to a less-than-significant level, similar to the Project. In addition, mitigation measure MM HZ-2a.2 requires the preparation of a site-specific health and safety plan, which would further ensure that all risks to workers, residents, or the public would be reduced to less than significant, the same as for the Project.

The Utilities Variant would require pile supports for the residential towers, the same as the Project. This construction activity could result in groundwater contamination from disturbed soils. Mitigation measure MM HZ-5a would reduce this impact by requiring a foundation support piles installation plan, which would verify that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. With implementation of this mitigation measure, the impact from potential groundwater contamination would be reduced to a less-than-significant level, the same as for the Project.

Shoreline improvements would occur under the Utilities Variant the same as for the Project. Shoreline improvements would require concurrence of BCDC, San Francisco RWQCB, and USACE. That permit would contain numerous conditions to ensure that the construction activities are conducted in a manner that is protective of aquatic resources. Mitigation measure MM HZ-10b requires that all shoreline activities that could affect sediment (or in the case of the Navy-installed cover and riprap at Parcel E/E-2) be conducted in accordance with agency-approved remedial design documents, applicable health and safety plans, DCPs, or any other documents or plans required under applicable law or laws, including but not limited to applicable requirements shown in Table III.K-2. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts. For Candlestick Point, impacts would be mitigated through mitigation measures MM HY-1a.1 and MM HY-1a.2. With implementation of these mitigation measures, along with applicable regulations and permits, potential impacts related to exposure to hazardous materials releases from contaminated sediments that could be disturbed during proposed shoreline improvements would be reduced to a less-than-significant level for the Utilities Variant, the same as for the Project.

Similar to the Project, remediation activities conducted on behalf of the City or developer in conjunction with development activities at HPS Phase II parcels transferred prior to completion of remediation in an "early transfer" would disturb soil and/or groundwater that may contain contaminants from historic uses. The identified mitigation measure (MM HZ-12) would require the SFDPH to ensure that before development occurs, the Agency or the developer and their contractors have incorporated all applicable requirements into remedial design documents, work plans, health and safety plans, DCPs and any other document or plan required under the AOC or other applicable law, as a condition of development. As a result of these controls and mitigation measure, the potential impact of exposure to hazardous materials during remediation activities conducted on behalf of the Agency or the developer in conjunction with development of HPS Phase II under the Utilities Variant would be reduced to less-than-significant levels.

In addition to uncovering hazardous materials within the existing buildings, construction and grading activities associated with the Utilities Variant could disturb soil or rock that is a source of naturally occurring asbestos, which could present a human health hazard. As discussed in the paragraph above, the Utilities Variant includes installation of utilities in addition to that anticipated under the Project. This additional work could result in an increase in the amount of excavation and ground disturbance, as compared to the Project. However, with the implementation of mitigation measure MM HZ-15, which requires preparation of an asbestos dust mitigation plan, this impact would be reduced to a less-than-significant level, similar to the Project.

As with the Project, the Bret Harte Elementary School and Muhammad University of Islam elementary schools are located within one-quarter mile of the development area of the Utilities Variant. Consistent with the discussion above, the Utilities Variant could uncover asbestos-containing materials (naturally or in existing building materials) or other hazardous materials during construction, consistent with the Project. However, with incorporation of mitigation measures MM HZ-1a, MM HZ-1b, MM HZ-2a.1, and MM HZ-15, any impacts to these schools would be reduced to a less-than-significant level, similar to the Project.

After development of the Utilities Variant, periodic maintenance could require excavation of site soils to maintain or replace utilities, repair foundations, or make other subsurface repairs which could expose hazardous materials. As the frequency of infrastructure maintenance under the Utilities Variant would likely be greater than the Project based on the increased amount of infrastructure, it is anticipated that the Utilities Variant could result in a slightly greater impact than the Project with respect to potential exposure to hazardous materials. Implementation of mitigation measures MM HZ-1a and MM HZ-1b would require remediation of any contaminated soils pursuant to the appropriate regulations. MM HZ-2a.1 would require the development of an unknown contaminant contingency plan to describe procedures to follow in the event unexpected contamination is encountered during construction activities, including procedures for ensuring compliance with the above laws and regulations. Additionally, mitigation measure MM HZ-2a.2, would require the preparation and implementation of a site-specific HASP in compliance with federal and state OSHA regulations and other applicable laws. The general requirement of mitigation measure MM HZ-9 would require that the Agency or its contractor or Project Applicant shall comply with all requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent for any properties subject to early transfer (prior to full Navy remediation). To reduce this impact related to exposure to hazardous materials releases that have not been fully remediated at HPS Phase II. Mitigation measure MM HZ-9 also requires that all work on the Yosemite Slough bridge would comply with Navy work plans for construction and remediation on Navy-owned property. Implementation of these mitigation measures would reduce this impact to a less-than-significant level, same as for the Project.

After construction, land uses anticipated under the Utilities Variant would involve the routine use, storage, transportation, and disposal of hazardous materials. None of the systems proposed for inclusion in the Utilities Variant would utilize hazardous materials other than routine maintenance and cleaning products typically used in residential, office and commercial settings. Products containing hazardous materials used in required to address additional square footage anticipated under the Utilities Variant would be incrementally small, and would not substantially increase the risk from handling these materials. The Utilities Variant would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, the same as for the Project. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. None of the outputs of the utility systems (hot water, chilled water, recycled water, sludge, solid waste, recyclable materials, and compostable materials) would contain hazardous materials in amounts greater than that which would be utilized under the Project (e.g., if building occupants disposed of small amount of hazardous materials, such as cleaning products, via trash receptacles or if the use of an automated solid waste collection system would not increase or decrease the presence of any such

substances). The Utilities Variant would comply with applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials.

Hazardous materials would routinely be transported to, from, and within the Project, and small amounts of hazardous waste would be removed and transported off site to licensed disposal facilities. The precise amount of hazardous materials that would be transported to or from the site under the Utilities Variant is difficult to predict accurately at the current time due to the pending selection of tenants for the future retail-commercial stores. However, it is understood that these uses would be consistent with those uses analyzed for the Project and therefore, potential impacts would be similar under this variant to the Project's impacts.

Daily operations under the Utilities Variant could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but this would not pose a human health risk and/or result in an adverse effect on the environment. With increased routine use of hazardous materials compared to existing conditions for Utilities Variant operations, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of the Utilities Variant. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could also occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the City. Impacts would be less than significant, similar to the Project.

The Utilities Variant site is not located within the San Francisco Airport Land Use Policy Plan Area and the Utilities Variant would not result in a safety hazard from airport operations for people residing or working in the area. The site is not located within any other airport land use plan area. The Utilities Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Similar to the Project, operation of the R&D Variant would not expose people or structures to a significant risk of loss, injury, or death involving fires or conflict with emergency response or evacuation plans.

Geology and Soils

Construction

As with the Project, construction activities, such as grading and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. The erosion hazard rating for the local soils in the Project site is slight to severe. Requirements to control surface soil erosion during and after construction with a Utilities Variant would be implemented through the requirements of mitigation measure MM HY-1a.1 (SWPPP) and adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, would be avoided or reduced to a less-than-significant level, similar to the Project.

In addition to the potential for soil erosion, construction activities would have the potential to affect groundwater levels. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by mitigation measure MM GE-2a (dewatering), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, the Utilities Variant would result in a less-than-significant impact, similar to the Project.

At the Alice Griffith Public Housing site and the Jamestown area, the removal of bedrock through heavy equipment methods or controlled rock fragmentation activities would have the potential to fracture rock adjacent to the excavation, thereby destabilizing it and possibly causing settlement of structures above it. With implementation of those techniques, ground surface and building damage monitoring, as specified in the SFBC and required by mitigation measure MM GE-3, vibration from controlled rock fragmentation in the area would not cause unacceptable settlement or damage at adjacent or nearby properties would occur. Consequently, settlement hazards related to controlled rock fragmentation would be less than significant, similar to the Project.

Operation

Impacts with respect to geology and soils conditions with the Utilities Variant would be substantially similar to those of the Project.

The potential for exposure to adverse effects caused by seismic groundshaking exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would require design-level geotechnical investigations that would include site-specific seismic analyses to evaluate the peak ground accelerations for design of the Utilities Variant structures and the Yosemite Slough bridge, as required by the SFBC and Caltrans. Implementation of these mitigation measures would ensure that potential impacts from groundshaking would be less than significant, similar to the Project.

The potential for adverse effects caused by seismically induced ground failure such as liquefaction, lateral spreading, and settlement exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, and MM GE-5a would require design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of the Utilities Variant structures, as required by the SFBC through review by DBI. It is anticipated that DBI would employ a third-party engineering geologist and/or civil engineer to form a GPRC. The GPRC would complete the technical review of proposed site-specific structural designs prior to building permit approval. The structural design review would ensure that all necessary mitigation methods and techniques were incorporated in the design for the Utilities Variant foundations and structures to reduce potential impacts from ground failure or liquefaction a less-than-significant level, similar to the Project.

With the Utilities Variant, the potential for adverse effects due to seismically induced landslides exists at the Project site. Implementation of mitigation measures MM GE-6a and MM GE-4a.2 would ensure compliance with the SFBC and any special requirements of the HUD for compliance documentation and would reduce potential impacts from landslides a less-than-significant level, similar to the Project.

With the Utilities Variant, additional utility infrastructure would be constructed throughout the Project site. None of these specific areas is located adjacent to the shoreline such that the Utilities Variant could result

in impacts greater than those discussed with the Project. Therefore, the Utilities Variant would result in a less-than-significant impact due to shoreline stability, similar to the Project.

The potential for adverse effects caused by landslides exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual Utilities Variant elements, as specified in mitigation measure MM GE-6a. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of this mitigation, the Utilities Variant's impact with regard to landslides would be less than significant, similar to the Project.

The potential for adverse effects due to settlement exists at the Project site. However, design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-5a, MM GE-4a.2, and MM GE-4a.3 would ensure compliance with the provisions of the SFBC and would reduce the impact a less-than-significant level, similar to the Project.

The potential for adverse effects caused by expansive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-10a, MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to the Utilities Variant structures from expansive soils a less-than-significant level, similar to the Project.

With the Utilities Variant, the potential for adverse effects caused by corrosive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-11a, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to the Utilities Variant structures from corrosive soils a less-than-significant level, similar to the Project.

Fault rupture hazards are unlikely. Ground rupture occurs most commonly along preexisting faults. No known active faults cross the Hunters Point shear zone, making hazards from fault rupture unlikely with the Utilities Variant.[1289] Therefore, there would be no impact caused by surface fault rupture, similar to the Project.

All development with the Utilities Variant would be connected to the City's existing wastewater treatment and disposal system and would not involve the use of septic tanks or alternative wastewater disposal systems. No impact would occur, similar to the Project.

The Utilities Variant would not substantially change site topography or affect unique geologic features, and would have no impact on such features, similar to the Project.

Hydrology and Water Quality

For this variant, heating and cooling would be provided from a centralized plant, instead of individual systems in each building or facility. In addition to the installation of a larger underground piping network than that required of the Project, the Utilities Variant includes the installation of underground storage tanks

[1289] GTC, 2005.

for the decentralized wastewater treatment plants. The Utilities Variant would result in the construction of approximately 30,000 square feet of underground storage space per wastewater treatment building, for a total of approximately 330,000 square feet of underground space. The district plant serving Candlestick Point is proposed to be located within the parking structure adjacent to the regional retail center, while the district plant serving Hunters Point is proposed to be located within the parking structure adjacent to the R&D facilities. All land uses at Candlestick Point and the HPS Phase II site would be constructed at the same locations and at the same intensities proposed with the Project, although some minor shifts in building locations could occur to accommodate some elements of the proposed utility systems, which would require some additional built space. As the footprint of development and the total amount of development would be incrementally greater than the Project, operational impacts to hydrology and water quality would be the substantially similar to the Project.

Construction

Operation of the Utilities Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, this variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As extent of impervious surfaces for the Housing Variant would be less than the Project, impacts would be similar and slightly less than the Project.

Development of the Utilities Variant would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge Construction of additional underground facilities could require short- and/or long-term dewatering, which could result in localized lowering of groundwater levels in the vicinity of these underground spaces. However, the approximately 330,000 square feet of underground space represents approximately 1 percent of the total 702-acre site, and a substantial lowering of groundwater levels resulting from short- or long-term dewatering is unlikely. Compliance with mitigation measure MM GE-2 (Mitigation to Minimize Dewatering Impacts during Construction) would ensure that this impact would be less than significant, similar to the Project. As the total amount of open space with the Utilities Variant would remain the same as with the Project, the amount of permeable surface would also remain the same. Therefore, the Utilities Variant would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the Utilities Variant area and, thus, no streams or rivers would be altered by construction activities. During construction of the Utilities Variant, the existing drainage patterns within the area would generally be preserved. Construction activities associated with the Utilities Variant would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on site or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated the Utilities Variant, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of a SWPPP), impacts would be less than significant, similar to the Project.

Operation

Operation of the Utilities Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, this variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As the footprint of development, land uses, and extent of impervious surfaces for the Utilities Variant would be the same as the Project, impacts would be similar to the Project.

The Utilities Variant would modify the wastewater treatment system to collect and route wastewater flows to decentralized wastewater treatment plants located throughout the Project site, instead of collecting and conveying wastewater to the Southeast Water Pollutant Control Plant (operated by SFPUC) for treatment. Each decentralized wastewater treatment plant would be sized to accommodate approximately 100,000 gallons per day of wastewater. To accommodate the estimated Project-generated wastewater flow of approximately 1.1 mgd, eleven decentralized wastewater treatment plants would be needed, with seven plants proposed to be located within Candlestick Park and four in Hunters Point, Therefore, wastewater flows from the Project site would be retained on site and not discharged to the Combined Sewer System.

Implementation of the Utilities Variant would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and this impact would be less than significant, similar to the Project.

Operation of the Utilities Variant could alter existing drainage pattern of the site, but would not alter the course of a stream or river or result in substantial erosion, siltation, or flooding on site or off site. Implementation of the Utilities Variant would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of the Utilities Variant would not place housing and other structures within the proposed 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce impacts to a less-than-significant level, similar to the Project.

Implementation of a Utilities Variant would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, the Utilities Variant would not expose people or structures to inundation by seiche, tsunami, or mudflow. Impacts would be less than significant, similar to the Project

Biological Resources

The additional subterranean work required under the Utilities Variant (as compared to the Project) for installation of the piping network, and heating/cooling towers, wastewater treatment facilities, and solid waste collection facilities would not increase the potential for impacts to biological resources as the amount of land disturbance, and therefore habitat, would not be increased. The Utilities Variant would generally involve the same amount of ground disturbance, shoreline improvements, and in-water work as the Project. Thus, overall construction-related impacts to biological resources would be similar to the Project. Implementation of the Utilities Variant would result in generally the same amount of development, would preserve the same amount of existing open space, and would create the same amount of new open space as the Project. Thus, operation of the Utilities Variant would result in similar, less than significant impacts to biological resources as the Project. Both construction and operational impacts to biological resources would be similar to the Project, as discussed below, because the type of development and associated construction activities are generally the same.

Construction

Development of the Utilities Variant would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, and no impact would occur, similar to the Project.

Development of the Utilities Variant would not have a substantial adverse effect, either directly or through habitat modifications, on any common species or habitats since ecological enhancements and measures to avoid and minimize impacts to common vegetation communities and wildlife species would be proposed, similar to the Project. Impacts would be less than significant, similar to the Project.

Development of the Utilities Variant could have a substantial adverse effect, either directly or through habitat modifications, on sensitive natural communities or species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur.

Similar to the Project, the Utilities Variant's Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b would be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur. Therefore, a net increase in the quality of raptor foraging habitat would result, similar to the Project, and, with mitigation, the overall effect on raptors is expected to be beneficial. Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring. Construction activities could impact designated critical habitat for green sturgeon and Central California Coast steelhead; however, compensatory mitigation for lost aquatic habitat as described in mitigation measures MM BI-4a.1 and MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Overall adverse effects would be less than significant, similar to the Project. Mitigation measures MM BI-4a.1, MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would reduce potentially significant impacts to Essential Fish Habitat to less-than-significant levels, similar to the Project. Ecological design features described in the Draft Parks, Open Space, and Habitat Concept Plan would result in increased habitat for western red bats, and impacts to this species would be less than significant.

Development of the Utilities Variant could have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project.

Development of the Utilities Variant would not conflict with the natural resource protection policies of the General Plan; however, it could result in the disturbance or loss of trees that are protected by the City's Urban Forestry Ordinance and Section 143 of the *Planning Code*. Mitigation measure MM BI-14a would

ensure that development does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. With implementation of mitigation measures MM BI-14a and MM BI-7b, the Utilities Variant would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, similar to the Project, and overall impacts would be beneficial.

Operation

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to oysters, and mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to oysters. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Development of the Utilities Variant could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site (eelgrass beds). Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce effects on eelgrass by surveying for and avoiding this habitat. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating species to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Implementation of the Utilities Variant would be consistent with the biological resources protection policies of the City of San Francisco General Plan, and with implementation of mitigation measure MM BI-14a, development would be constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of the Utilities Variant would not conflict with any local policies or ordinances protecting biological resources, and there would be no impact.

Public Services

Construction

Police and Fire Services

Similar to the Project, access to the Utilities Variant site during construction would be maintained by implementation of a construction management traffic plan (CMTP) MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program

of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the area would be implemented.

Similar to the Project, construction of the Utilities Variant would not result in increased demand on police protection services, as demands on the SFPD during construction would be supplemented by private security (as required by mitigation measure MM PS-1 [site security measures during construction]), and construction areas would be secured through the installation of fencing and gates.

Therefore, the Utilities Variant would result in a less-than-significant impact to police protection and fire services during construction, as construction of the Utilities Variant would not impact SFPD or SFFD response times upon implementation of a CMTP. These impacts would be similar to the Project.

Schools and Library Facilities

Construction of the Utilities Variant would not result in impacts to the SFUSD or the San Francisco Public Library System. SFUSD or library facilities are not located on the Project site. All area school and library services would be available to the community throughout the duration of Project construction. As such, since construction of the Utilities Variant would be similar to construction of the Project, no impact to school or library services during construction of the Utilities Variant would occur. These impacts are the same as those identified for the Project.

Operation

Police Protection Services

Development with the Utilities Variant would have similar impacts to police protection services as development with the Project. Although the Utilities Variant would increase the amount of utility infrastructure and some associated employees, since operational impacts to police protection services were found to be less than significant for the Project, impacts to police protection services for the Utilities Variant would also be less than significant.

Fire Protection Services

Development with the Utilities Variant would have similar impacts to fire services as development with the Project. Although the Utilities Variant would increase the amount of utility infrastructure and associated employees, since operational impacts to these services were found to be less than significant for the Project, impacts to these services for the Utilities Variant would also be less than significant.

Building Safety

All new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help minimize demand for future fire protection services. Plan review of all structures for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services.

Response Time

Construction of a new SFFD facility on land designated for community serving uses on the Utilities Variant site, along with the provision of additional firefighters and on-going fire protection operations, would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. The Applicant has designated 5.3 acres of community-serving uses in HPS Phase II, including 0.5 acre of which have been designated for a new SFFD facility.

These uses have been anticipated as part of the Utilities Variant and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Utilities Variant. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[1290] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. Therefore, similar to the Project, the development of the Utilities Variant would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is less than significant.

Schools

Operational impacts to schools would be similar to the Project because the number of dwelling units anticipated would be the same. Therefore, the number of school-age children that would require adequate school services would be the same as with the Project. Impacts from the Utilities Variant on schools would be less than significant, similar to the Project.

Library Facilities

Operational impacts to libraries would be similar to the Project because the same number of dwelling units anticipated would be the same. Therefore, the service population for the existing library facilities would be the same as with the Project. Similar to the Project, library branches that currently serve the area including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Therefore, the Utilities Variant would result in a less than significant operational impact to library services, similar to the Project.

[1290] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

Recreation

The Utilities Variant includes all development proposed with the Project plus the addition of substantial infrastructure including a subterranean piping network, new heating and cooling towers, new wastewater treatment facilities, and relocated/redesigned solid waste collection facilities. The installation of additional infrastructure to better serve the proposed development would not result in the generation of additional residents or substantial additional employees in the area that would result in additional demand on recreational opportunities. As the amount of open space and parks, the total amount of development, and the land uses provided with the Utilities Variant would be the same as the Project (and the same as the Utilities Variant), impacts to recreation would also be similar to the Project. This Variant, like the Project, would provide approximately 336.4 acres of parks and open space.

Construction impacts related to recreational facilities would be the same as those identified with the Project because the construction activities would be the same. The Utilities Variant would have the same number of housing units as proposed with the Project, thereby resulting in the same residential population of 24,465. Operational impacts are determined based on a ratio of acres of parkland per resident. Currently, the City provides approximately 7.1 acres of parkland per thousand residents, and the standard used in Section III.P assumes a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet the demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. The parkland-to-population ratio associated with the Utilities Variant would be 13.7, which is the same as the Project. The Utilities Variant ratio would be considerably higher than the ratio of 5.5 acres of parkland per thousand residents, which is considered sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. Impacts would be less than significant.

The timing of Utilities Variant development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities. The conceptual development plan for this Variant would result in the development of residential units and parks during all of four stages of development. Table III.P-3 (Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the Utilities Variant). As this table indicates, the park-to-population ratio would not drop below 13.8 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population. Adequate parkland would be provided during each stage of development.

However, during a given phase, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed, and a less-than-significant impact would result.

A Technical Memorandum was prepared to study wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes development at the Project site (even if under the Utilities Variant), generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). Because this Variant is the same as the Project in terms of development amounts and locations, it would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

In summary, impacts resulting from the Utilities Variant would be substantially similar to the Project.

Utilities

As discussed in the introduction, the Utilities Variant includes all development proposed with the Project plus the addition of substantial infrastructure including a subterranean piping network, two heating/ cooling plants to provide a more centralized system, eleven individual wastewater treatment facilities, and two central solid waste collection facilities. With the Utilities Variant, upgrades to the individual utility systems are considered for the Project. As such, generally the Utilities Variant would not result in significant impacts that would require the construction of new or expanded facilities to handle projected demand and a less-than-significant impact would result, creating a lesser impact than the Project. Additionally, the Utilities Variant would treat wastewater on site, rather than sending it to the municipal plant for treatment thereby also reducing impacts.

Similar to the Project, with the Utilities Variant, the installation of additional infrastructure to better serve development would not result in the generation of substantial additional residents or employees in the area that would result in additional wastewater generation requiring treatment. Therefore, the Utilities Variant would not require or result in the construction of new or expanded water treatment facilities, the construction of which could cause significant environmental effects, and would result in a less-than-significant impact. Furthermore, the Utilities Variant includes installation of a wastewater treatment system, including 11 decentralized facilities to handle all treatment demand. With the Utilities Variant, all wastewater treatment would be handled on site rather than conveying the water to the SFPUC, as is done currently. This would relieve the SFPUC of treatment of approximately 1.05 mgd, creating a beneficial effect on wastewater treatment, compared to the Project. Construction activities would include replacement of existing wastewater conveyance lines within the area and new decentralized wastewater treatment facilities. Impacts related to these construction activities would be less than significant, generally similar to the Project.

Water

While operation of the Utilities Variant would not generate additional population (residents or employees, permanent or temporary), operation of the proposed utility system would increase water demand. Although the piping network would be substantially larger with the Utilities Variant, much of this is to convey solid

waste and would not increase water demand. However, operational activities of the two heating/cooling plants, the eleven wastewater treatment plants, as well as the two solid waste collection facilities would increase water usage. It is important to note that this operational water demand for utilities would effectively be shifted within the existing area-wide water usage because existing utility service provider(s) would otherwise be handling the associated heating/cooling distribution, wastewater treatment, and solid waste collection for the site and would require water during their operations. These utility operations are being shifted "on site" away from the existing service providers with the Utilities Variant and effectively, the water demand is being shifted as well. Little, if any, additional water demand would be placed on the water system at an areawide level to provide these services. Therefore, the Utilities Variant would not require water supplies in excess of existing entitlements and resources or result in the need for new or expanded entitlements and would result in a less-than-significant impact. Additionally, as discussed above, with the Utilities Variant, treatment at the decentralized wastewater treatment facilities would produce approximately 1.05 mgd of recycled water, and total water demand would be reduced by an equivalent amount. Thus, the water demand impact of the Utilities Variant would be less than the Project.

Wastewater

With the Utilities Variant, expansion of existing wastewater conveyance or treatment facilities operated by the SFPUC would not be necessary and no impact would occur. As the area would no longer contribute stormwater or wastewater to the Combined Sewer System operated by the SFPUC, the Utilities Variant would result in an exceedance of treatment capacity and would result in a less-than-significant impact. However, this impact would be less than anticipated with the Project.

Implementation of the Utilities Variant would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, and a less-than-significant impact would occur, similar to the Project.

Solid Waste

Construction of the Utilities Variant, including demolition of existing facilities, could generate solid waste that exceeds the permitted capacity of landfills serving the City of San Francisco. Trenching and excavation for the subterranean piping network and underground storage facilities (for the wastewater treatment facilities) could result in additional material that needs removal from the site. While it is assumed that at least some of this material can be utilized elsewhere within the development area, the potential for additional haul trips could result. However, any potential impact would be reduced to a less-than-significant level by implementation of mitigation measure MM UT-5a (Construction Waste Diversion Plan), similar to the Project.

Implementation of the Utilities Variant includes operation of a more sophisticated infrastructure system. The Utilities Variant would not substantially increase the number of residents or employees in the area, and would, therefore, not substantially increase solid waste generation. Operation of the decentralized waste treatment facilities would generate approximately 2,238 tons of sludge per year, which would be recycled, composted, or disposed of in landfills as permitted. The solid waste collection system that is proposed with the Utilities Variant would make it easier for residents and employees to recycle by creating a single point drop off for waste and recyclables. This waste stream would be sorted on site, prior to being hauled off site to a landfill or recycling station. Therefore, by making it easier for people to utilize methods of solid waste disposal other than waste that is taken to landfills, the Utilities Variant has the potential to reduce the generation of solid

waste arriving at San Francisco landfills. As operation of the Utilities Variant would not generate substantial solid waste, this Variant would not exceed the permitted capacity of landfills serving the City of San Francisco over what was analyzed for the Project, and impacts would be less than significant, similar to the Project.

Furthermore, operation of the Utilities Variant would be required to comply with federal, state, and local statutes and regulations related to solid waste, including the disposal of sludge. This impact would be less than significant with mitigation, similar to the Project.

Electricity, Natural Gas, and Telecommunications

The proposed improvements within the Project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. The power supplier may service the project via new extensions of the 12KV distribution and or 115KV transmission lines into HPS Phase II. This could include a new substation within the Project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the Utilities Variant, similar to the Project. Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR. The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for the Utilities Variant, similar to the Project.

Energy

Construction

Similar to the Project, construction would not be expected to result in demand for natural gas. However, construction of the Utilities Variant would require the use of electricity and fossil fuels. The construction activities proposed with the Utilities Variant do not include unusual or atypical activities that would result in a higher than average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy. Thus, construction activities would not be large in comparison to a project of a similar size and with similar land uses. Thus, the Utilities Variant would result in a less-than-significant impact, similar to the Project.

Operation

Operation of the Utilities Variant would include electricity and natural gas demand to run the heating and cooling plants, wastewater treatment plants and solid waste collection system and facilities. These uses would increase the use of electricity and natural gas in the area, however, this would not be considered a wasteful

use. Additionally, provision of these heating and cooling utilities in a centralized fashion would reduce the overall use of electricity and natural gas as compared to a decentralized system. The on-site wastewater treatment facilities would require an increased use of electricity and natural gas as compared to existing conditions at the site. However, by removing the wastewater generation of the Project from the wastewater stream treated by the SFPUC, electricity and natural gas utilized by the SFPUC would be reduced and effectively shifted to provide service with the Utilities Variant. As such, the overall demand on the grid would not be substantially increased. The proposed solid waste collection system would require additional electricity to run the collection facilities. However, the centralized collection areas have the potential to reduce the amount of waste being transferred to landfills based on the ease provided to residents and employees for recycling and alternative waste provisions. The reduction in waste and the centralized collection locations would reduce the amount of space allotted within each building to solid waste collection, which would effectively be transferred into these larger collection facilities, reduce the number of trucks to and from the area, and reduce the number of trips and idling that garbage trucks would generate around the proposed neighborhoods. Therefore, while operation of the Utilities Variant may increase the demand for electricity and natural gas, this use would not be considered wasteful and would not be large in comparison to operations of a similar size, and the Utilities Variant would result in a less-than-significant impact, similar to the Project.

Greenhouse Gas Emissions

The Utilities Variant would involve the development of additional on-site utility infrastructure. While construction of centralized utilities would result in a greater amount of development, most of the development would be underground, and the level of overall above-ground development with this alternative would be substantially similar to the Project. Construction and operational impacts would be substantially similar to the Project. The GHG emissions may even decrease due to the availability of less carbon intense electricity sources and alternatives for heating and cooling. However, depending on the amount of energy required to operate these new utilities, the GHG emissions may increase slightly. Since the majority of the GHG emissions for the Utilities Variant would remain the same, the GHG emissions would be less-than-significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the Utilities Variant and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change. The Utilities Variant would not measurably change the parameters of the Project land use program, and thus this analysis applies to the Utilities Variant.

IV.F VARIANT 5: SAN FRANCISCO 49ERS AND OAKLAND RAIDERS SHARED STADIUM AT HUNTERS POINT SHIPYARD

IV.F.1 Overview

The San Francisco 49ers and Oakland Raiders Shared Stadium at Hunters Point Shipyard Variant (49ers/Raiders Shared Stadium Variant) assumes that development would occur exactly as proposed for the Project, except that the new stadium would be home to both the San Francisco 49ers and the Oakland Raiders. Therefore, there would be an increase in the number of football games that would occur during the NFL football season, which lasts from August until late December. This could result in an event at the stadium every week during the football season. For the purposes of this analysis, 20 football games and 20 other events per year were assumed. This assumption assumes a conservative, but possible scenario. It includes two pre-season and eight regular season games, and the possibility that either team could host up to two post-season playoff games. However, a maximum of four post-season games would only occur at the proposed stadium if (1) both teams were in separate conferences (American Football Conference or National Football Conference), (2) each team hosted and won either a first round wild-card playoff game or a second round divisional playoff game, and (3) each team then hosted a conference championship game. The likelihood of four post-season games occurring is remote; therefore, this EIR analysis only assumes up to two playoff games per year total, for a total of 20 games annually, the same as for the Project.

IV.F.2 Project Objectives

The objectives for the 49ers/Raiders Shared Stadium Variant would be the same as for the Project. A full list of Project objectives is provided in Section II.D of this EIR.

IV.F.3 Characteristics

Section II.E outlines the Project's land use plan, parks and open space plan, transportation improvements, infrastructure plan, community benefits, and green building concepts. Each of these components of the Project would also apply to this variant.

IV.F.4 Potential Environmental Effects

Overall, the 49ers/Raiders Shared Stadium Variant would not change the amount or type of development compared to the Project. However, the 49ers/Raiders Shared Stadium Variant includes an increase in NFL events per season from 12 to 20 games. Development with this Variant is also likely to result in events occurring weekly for the entire NFL season. Thus, no construction-related environmental effects would occur in excess of those identified for the Project. The potential operational effects of the 49ers/Raiders Shared Stadium Variant would be related to the increase of stadium use and would affect air quality, noise, transportation, utilities, energy, and aesthetics.

Land Use and Plans

Development of the 49ers/Raiders Shared Stadium Variant would be substantially similar to the Project and would not physically divide an established community or conflict with plans, policies, or regulations adopted to avoid or mitigate an environmental effect. Operation of the 49ers/Raiders Shared Stadium Variant would alter the existing land use character of the vicinity, but such an alteration would not be adverse, similar to the Project. The 49ers/Raiders Shared Stadium Variant would include eight additional football games a year. This additional use is consistent with uses and building characteristics proposed with the Project. Therefore, these additional event days would not result in an adverse change to the land use character of the site or the surrounding areas, and the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact, similar to the Project. The 49ers/Raiders Shared Stadium Variant would result in an urban development replacing deteriorating industrial and open space, similar to the Project, and would not conflict with existing land use plans. Thus, potential impacts of the 49ers/Raiders Shared Stadium Variant to land use and plans would be less than significant, similar to the Project.

Population, Housing, and Employment

In general, impacts from the 49ers/Raiders Shared Stadium Variant would be similar to the Project because land uses and densities are the same, with the exception of increased use of the football stadium. The 49ers/Raiders Shared Stadium Variant would allow 8 more football games at the football stadium. However, the 49ers/Raiders Shared Stadium Variant would not increase the number of residential units, nor other land uses. As such, the 49ers/Raiders Shared Stadium Variant would have the potential to increase the number of employment opportunities (operational) at the site over levels anticipated with the Project, as discussed below. However, the permanent residential population would not change.

Direct Impacts

With the 49ers/Raiders Shared Stadium Variant, construction is scheduled for completion beginning in the Year 2017, extending through the Year 2029, a period of approximately 12 years. This is similar to the construction schedule proposed at the HPS Phase II site for the Project, and, therefore, the number of construction personnel required at any given time at the HPS Phase II site would be similar to the total projected to be required for the Project. Construction employment opportunities are temporary in nature and would not result in a substantial increase in the number of employees in the area. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less than significant construction impact to population during construction.

Direct population growth with the 49ers/Raiders Shared Stadium Variant would include residents and employees who would occupy new homes and the employment space(s), respectively. With the 49ers/Raiders Shared Stadium Variant, 8 more football games would occur at the football stadium. There would be no change to the number of proposed housing units; therefore, the permanent resident population with the 49ers/Raiders Shared Stadium Variant would be the same as with the Project. However, the 49ers/Raiders Shared Stadium Variant would increase the number of jobs compared to the Project due to 8 more football games. As identified in Section III.C, the stadium is anticipated to generate approximately 359 jobs when used for football events (12 football games and 20 other events with the Project). With the 49ers/Raiders Shared Stadium Variant, 8 more football games would result in

approximately 10,820 jobs, approximately 90 more than the Project (refer to Table III.C-7 [Project Employment by Land Use]). Total employment with the 49ers/Raiders Shared Stadium Variant would represent approximately 1.4 percent of the 748,100 jobs anticipated Citywide in 2030. Overall, development with the 49ers/Raiders Shared Stadium Variant would be similar to the Project.

Although the 49ers/Raiders Shared Stadium Variant would result in an increase in employment at the HPS Phase II site, growth in this area has long been the subject of many planning activities. As with the Project, the 49ers/Raiders Shared Stadium Variant development program is based on the land uses, number of housing units, and objectives approved by voters under Proposition G in 2008. The uses proposed with the 49ers/Raiders Shared Stadium Variant would support planned growth for the Candlestick Point and HPS Phase II. As a result of these ongoing planning activities, City service providers have been aware of, and have included future growth projections for site in their long-term operations plans for population growth and necessary infrastructure.

Employment growth at HPS Phase II would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. The 49ers/Raiders Shared Stadium Variant would not alter the number of housing units proposed with the Project. There would be a net increase in jobs; however, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact, similar to the Project. Total demand for housing with the 49ers/Raiders Shared Stadium Variant would represent 3.9 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section III.C.3 projected by ABAG through 2014.[1291] Based on the total employment available with the 49ers/Raiders Shared Stadium Variant (10,820 jobs), total housing demand would be 8,330 units (approximately 90 more employees associated with 8 more football games would result in housing demand for 69 more units than the Project, refer to Table III.C-9 [Project Housing Demand]).[1292] As discussed above, the 49ers/Raiders Shared Stadium Variant would provide approximately 10,500 dwelling units. This would exceed the approximately 8,330 dwelling unit demand anticipated with the 49ers/Raiders Shared Stadium Variant. Therefore, the population increase associated with employment with the 49ers/Raiders Shared Stadium Variant could be entirely accommodated. However, it is likely that some employees with the 49ers/Raiders Shared Stadium Variant would elect to live elsewhere in the City or within surrounding Bay Area communities.

Based on existing commuting patterns, the 49ers/Raiders Shared Stadium Variant would generate a demand for about 3,749 units in surrounding Bay Area communities. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that the increase in employment with the 49ers/Raiders Shared Stadium Variant would create a substantial demand for housing in the immediate neighborhood, in San Francisco, or in the region in excess of the housing provided as part of the 49ers/Raiders Shared Stadium Variant or housing otherwise available in the Bay Area. Necessary improvements to infrastructure, public services, and housing associated with direct population growth proposed as part of the 49ers/Raiders Shared Stadium Variant

[1291] The RHNP is updated every five years and does not extend through 2030.
[1292] Calculated as the projected employment divided by 1.36, plus 4.7% additional housing units to account for vacancy rate, times 55% total demand in San Francisco.

has been anticipated in ongoing local and regional planning activities. All impacts associated with direct population growth are considered less than significant, similar to the Project.

Indirect Impacts

As infrastructure, public services, roads, and other services and communities amenities are expanded, there would also be potential for development with the 49ers/Raiders Shared Stadium Variant to generate indirect population growth. Indirect growth is often defined as "leapfrog" development, development that occurs as infrastructure is expanded to previously un-served areas. Such development patterns usually occur in suburban areas adjacent to undeveloped lands. Areas surrounding the 49ers/Raiders Shared Stadium Variant site are built out, except for sites such as Executive Park or India Basin that are currently undergoing development or are the subject of planned future development. Thus, the surrounding lands are not vulnerable to leapfrog-type development.

Infrastructure and services would be expanded to serve both the Candlestick Point and HPS Phase II sites, without significant excess capacity that might encourage additional local growth beyond that already anticipated under Proposition G and with the redevelopment plans. Development with the 49ers/Raiders Shared Stadium Variant would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. All impacts associated with indirect population growth are considered less than significant, similar to the Project.

The potential for impacts due to housing displacement would be the same as the Project, and would be less than significant. The 49ers/Raiders Shared Stadium Variant would not increase residential units proposed with the Project however, any dwelling units removed with the 49ers/Raiders Shared Stadium Variant would be replaced on site by the proposed development.

■ Transportation and Circulation

The 49ers/Raiders Shared Stadium Variant assumes that both the 49ers and Oakland Raiders would play home games at the new stadium at HPS Phase II. This Variant addresses the requirements of the National Football League (NFL) for NFL teams in close geographic proximity to one another to evaluate the potential shared use of a stadium. Land uses would be identical to the Project, however, the number of days during which football games would occur at the stadium would increase from 12 under the Project to 20 under the 49ers/Raiders Shared Stadium Variant. Given that the teams typically play half of all pre-season, post-season, and regular season games at home, the use of the stadium by two NFL teams could result in one NFL event at the stadium occurring every week from the beginning of the pre-season in August through the end of December for up to 20 NFL events per year. In addition, there would also be up to 20 secondary smaller events at the stadium per year.

The 49ers/Raiders Shared Stadium Variant would not result in an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system, and would be similar to that analyzed for the Project. The 49ers/Raiders Shared Stadium Variant would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management plan (CMP) for roads or highways. However, similar to the Project, traffic impacts related to the new stadium would be significant and unavoidable. The stadium would still likely host special events and would have the same impacts as the Project.

The 49ers/Raiders Shared Stadium Variant site is not located within the San Francisco Airport Land Use Policy Plan Area or other airport land use plan, and therefore, would not result in a safety hazard from airport operations for people residing or working in the area. The 49ers/Raiders Shared Stadium Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less than significant impact to aircraft activity and traffic levels, similar to the Project.

Development under the 49ers/Raiders Shared Stadium Variant would not affect or increase hazards due to design features or incompatible uses aboveground. The new buildings would be designed consistent with the SFBC, which would reduce all potential design hazards to a less than significant level. The roadway network associated with the 49ers/Raiders Shared Stadium Variant would be designed to meet all applicable codes, including design guidelines for emergency access, and would result in a less than significant impact associated with design hazards. As a similar amount of development would result from the 49ers/Raiders Shared Stadium Variant as the Project, and since the same design standards would apply for both, potential traffic impacts from design hazards would be similar to the Project.

Thus substantial additional parking, above that provided by the Project, would not be required, and impacts would be less than significant. As the same amount of development and the same land uses would occur under the 49ers/Raiders Shared Stadium Variant as with the Project, parking impacts would be similar to the Project.

The 49ers/Raiders Shared Stadium Variant would comply with adopted policies and plans regarding alternative transportation, and impacts would be less than significant, similar to the Project.

Aesthetics

Construction

All construction-related impacts of the 49ers/Raiders Shared Stadium Variant would be similar to those identified for the Project since the development program is the same. All potential aesthetics impacts resulting from construction of the Project were found to be less than significant with the incorporation of mitigation measure MM AE-2 (Mitigation for Visual Character/Quality Impacts during Construction), which requires contractors to keep construction areas generally clean, regulates worker parking, requires strict control of the staging of equipment, and requires temporary fencing to block views of the staging areas from the street. MM AE-2 (construction staging) would be required with the 49ers/Raiders Shared Stadium Variant and impacts would, therefore, be less than significant with this Variant as well. Since construction of the 49ers/Raiders Shared Stadium Variant would, like the Project, be constructed during daylight hours, impacts resulting from additional sources of light and glare during construction would be less than significant.

Operation

Operation-related impacts of the 49ers/Raiders Shared Stadium Variant would be similar to those identified for the Project since the development program with each is the same. However, the 49ers/Raiders Shared Stadium Variant proposes to double the number of NFL events to 20 per year. The stadium would physically exist regardless of the number of events per year. Section III.E of this EIR found that effects resulting from the relocation of the stadium to HPS would not cause significant impacts related to substantial sources of new light and glare. Since it is estimated that the lighting towers at the stadium

would be 192 feet above street level, the lights can be focused directly onto the playing surface, which would minimize spillover lighting and generate virtually no additional light or glare in the surrounding area. In addition, the playing surface would not be visible outside of the stadium, thereby eliminating the possibility of glare from the playing surface impacting surrounding areas. The EIR found that light spill from the stadium would be between 0.2 and 1.0 foot-candle. Such a change in the light level at this location would be less than that associated with typical street lighting, which is not considered substantial. Project mitigation measures MM AE-7b.1 (field lighting testing) and MM AE-7b.2 (field lighting testing) would be incorporated into the 49ers/Raiders Shared Stadium Variant and would require any spillover of light from the stadium to be similar to that of surrounding street lighting. Since the impact of stadium light and glare is less than significant with the incorporation of mitigation measures with the Project, the doubling of the number of games with this Variant would not result in a significant impact.

All other impacts to visual character and scenic vistas related to the operation of the Project were found to be less than significant. The stadium use proposed with the Project would be the same with the 49ers/Raiders Shared Stadium Variant. Although the number of game days would be increased, the use would be the same and the amount of lighting needed for each use would be the same. Impacts resulting from the creation of additional light or glare that could impact scenic views of downtown or impacts surrounding land uses were found to be less than significant with the incorporation of mitigation measures MM AE-7a.1 (parking lot lighting), MM AE-7a.2 (landscape and sign illumination), MM AE-7a.3 (lighting plan), MM AE-7a.4 (non-reflective materials), MM AE-7b.1 (field lighting testing), and MM AE-7b.2 (field lighting testing). These measures require parking lot, security, and landscaping lighting to comply with City requirements that eliminate light spill onto surrounding uses and that proposed structures are constructed with non-reflective surface to eliminate glare. Therefore, since the 49ers/Raiders Shared Stadium Variant is the same as the Project with respect to the stadium use, impacts would be less than significant with mitigation.

Shadows

The 49ers/Raiders Shared Stadium Variant would result in the same development as the Project. The 49ers/Raiders Shared Stadium Variant would have the same impacts related to solar access as the Project. Overall, given the heights, layouts, and orientations of the Project buildings, existing parks and open space would experience variable levels of shading throughout the day, generally receiving some new shade from morning until noon in spring, summer, and fall with less increase in the afternoons in winter, spring, and fall. Public use of these existing parks in the vicinity of Candlestick Point would not be adversely affected by these shade conditions and impacts would be less than significant, similar to the Project.

The CPSRA would be affected by new shade in the afternoon but most areas would experience limited to no new shadow from the Project. Other areas of the CPSRA would largely continue to remain in the sun throughout the year. Project shadow would not interfere with the public's use or enjoyment of the CPSRA and impacts would be less than significant, similar to the project.

Wind

Since the proposed development with the 49ers/Raiders Shared Stadium Variant would be the same as the Project, impacts related to wind would be the same as the Project. The 49ers/Raiders Shared Stadium Variant would increase use of the stadium, which would have no effect on wind impacts. With the

incorporation of mitigation measure MM W-1a (Building Design Wind Analysis), impacts would be reduced to a less than significant level, similar to the project.

Air Quality

Since the proposed development with the 49ers/Raiders Shared Stadium Variant is exactly the same as the Project, impacts related to air quality would be substantially the same as the Project. The 49ers/Raiders Shared Stadium Variant only proposes more use of the stadium, which slightly increases the criteria pollutant emissions associated with extra use of the stadium and traffic coming to extra games.

Section III.G found that all impacts related to wind were less than significant with the incorporation of mitigation measure MM W-1a (wind modeling). This mitigation measure requires that a Building Design Wind Analysis be prepared prior to approval of 49ers/Raiders Shared Stadium Variant buildings, ensuring that the applicable 26 mph threshold would not be exceeded. If an impact would occur, the developer would be required to implement measures to reduce potential wind impacts. Thus, similar to the Project, impacts would be less than significant.

Construction

As stated above, overall construction impacts of the 49ers/Raiders Shared Stadium Variant with respect to air quality would be the same as the Project. The level of development with 49ers/Raiders Shared Stadium Variant and the level of construction activities that would occur over the approximately 20-year build-out period would be the same as the Project. Similar to the Project, construction activities with 49ers/Raiders Shared Stadium Variant would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures, use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. However, the BAAQMD does not recommend any significance thresholds for the emissions during construction. Instead, the BAAQMD bases the criteria on a consideration of the mitigation measures to be implemented. If all appropriate emissions mitigation measures recommended by the BAAQMD CEQA Guidelines are implemented for a project, construction emissions are not considered adverse. Fine particulate matter (PM_{10}) is the pollutant of greatest concern with respect to construction activities. Any project within the City of San Francisco, including the 49ers/Raiders Shared Stadium Variant, would be required to comply with San Francisco Health Code Article 22B, Construction Dust Control, which requires the preparation of a site-specific dust control plan, (with mandatory mitigation measures similar to the BAAQMD's) for construction projects within 1,000 feet of sensitive receptors (residence, school, childcare center, hospital or other health-care facility or group-living quarters). As such, with implementation of mitigation MM HZ-15, which identifies specific mitigation measures that would be used to reduce emissions associated with construction, construction-related criteria pollutant impacts associated with the 49ers/Raiders Shared Stadium Variant would be less than significant and the same as the Project.

With respect to airborne human health risks, construction activities associated with the 49ers/Raiders Shared Stadium Variant would increase the levels of two potential human health risks: (1) diesel particulate matter (DPM) and (2) dust or particulate matter (PM_{10}) bound to certain metals and/or organic compounds from on-site soils. MM AQ-2.1 (Implement Accelerated Emission Control Device Installation on Construction Equipment) and MM AQ-2.2 (Implement Accelerated Emission Control Device Installation on Construction Equipment Used for Alice Griffith Parcels) would address construction sources of DPM including off-road construction equipment such as lifts, loaders, excavators, dozers, and graders. In addition, the delivery of equipment and construction materials, spoils and debris hauling, and employee commute traffic could contribute to construction-related DPM emissions. In terms of DPM, ENVIRON prepared a human health risk assessment (HRA)[1293] that evaluated potential human health risks associated with construction and operation of the Project. As construction emissions associated with the 49ers/Raiders Shared Stadium Variant are expected to be the same as those associated with Project, the 49ers/Raiders Shared Stadium Variant would have the same impacts than the Project, would not exceed the BAAQMD CEQA threshold. As the carcinogenic and non-carcinogenic health risks posed by DPM emissions during construction activities associated with development of the 49ers/Raiders Shared Stadium Variant have been determined to be below established thresholds, this impact is less than significant with MM AQ-2.1 and MM AQ-2.2, similar to the Project.

Similar to the Project, construction activities at both Candlestick Point and HPS Phase II for the 49ers/Raiders Shared Stadium Variant have the potential to generate TACs associated with soil-PM_{10} and an HRA evaluated the potential concentrations of the airborne soil-PM_{10} at numerous receptors on site (residents at the Alice Griffith Public Housing units) and off site (adult and child residents, workers, and schoolchildren) in the Project vicinity. As the carcinogenic and noncarcinogenic health risks posed by soil-PM_{10} emissions during construction activities associated with development of the Project have been determined to be below established thresholds, the same impacts would be expected from the 49ers/Raiders Shared Stadium Variant. This impact is less than significant with MM HZ-15, similar to the Project.

Operation

Operational impacts to regional and local air quality would be substantially similar to the Project. The anticipated land uses would remain the same as the Project and impacts would be the same as identified with the Project. It should be noted that the shared use of the stadium by the San Francisco 49ers and the Oakland Raiders would increase the annual usage of the stadium but not the daily use. As such, the daily emissions anticipated with 49ers/Raiders Shared Stadium Variant would be the same as the Project.

Both this variant and the Project would result in fewer emissions during the operation of their respective land uses compared to a similar level of development without the energy and transportation considerations discussed in this EIR. 49ers/Raiders Shared Stadium Variant, similar to the Project, would incorporate features intended to reduce motor vehicle trips, designed as a dense, compact development with a mix of land uses that would facilitate pedestrian, bicycle, and transit travel. Nonetheless, criteria pollutant emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with land uses anticipated with the 49ers/Raiders Shared Stadium Variant would be expected to exceed existing BAAQMD thresholds. Under BAAQMD's

[1293] Environ. 2009. Ambient Air Quality Human Health Risk Assessment: Candlestick Point – Hunters Point Shipyard Phase II Development Plan. September 28. Appendices I & II.

current thresholds, impacts are considered significant if daily emissions of criteria pollutants exceed 80 lbs/day of ROG, NO_X, and PM_{10}. Similar to the Project, no additional feasible mitigation measures are available to reduce 49ers/Raiders Shared Stadium Variant's operational criteria emissions below the BAAQMD thresholds. This would be a significant and unavoidable impact.

With respect to airborne human health risks, emissions associated with operation activities under the 49ers/Raiders Shared Stadium Variant would increase the levels of two potential human health risks: (1) TACs and (2) vehicle emissions ($PM_{2.5}$).

This 49ers/Raiders Shared Stadium Variant continues to include R&D facilities at HPS Phase II, which are situated on a peninsula extending to the south of other proposed residential areas. As the predominant winds are out of the west, on-site receptors will generally be upwind from these R&D areas. As such, the Project is designed to minimize potential adverse impacts between TAC sources in R&D areas and both on-site and off-site receptors. As discussed for the R&D Variant, an analysis was conducted to determine the potential impacts from a variety of TAC sources in the R&D areas. Details regarding this assessment can be found in Appendix H1, Attachment III.[1294]

The HRA estimated the excess lifetime cancer risk and chronic noncancer HI due to the combined TAC emissions from the R&D areas at any surrounding receptor location. As the 49ers/Raiders Shared Stadium Variant has the same configuration as the Project, the estimated cancer risks for long-term residential exposure would be above 10 in one million in an area designated as open space that would extend slightly south beyond the R&D boundary. The maximum estimated cancer risk for a residential receptor in this location would be 17 in one million; the noncarcinogenic health risks would have an HI of 1.7. However, as noted above, this receptor location would be in an area designated as open space, and would not be a residential location. If cancer risks were estimated based on exposure assumptions consistent with recreational use of the open space, the risks would be reduced well below the threshold of 10 in one million. Due to the decrease in the frequency and duration of potential exposures, the chronic HI would also be reduced below the HI threshold of 1.0

The estimated health risks would be below BAAQMD thresholds for all residential receptor locations as a result of implementation of the Project. As such, impacts would be less than significant with implementation of MM AQ-6.1 and MM AQ-6.2 developed for the Project and also required for the 49ers/Raiders Shared Stadium Variant.

- In terms of human health risks associated with vehicle emissions, vehicle emissions along local roadways for the 49ers/Raiders Shared Stadium Variant (Variant 5) would remain unchanged from the Project. The prolonged exposure of receptors to increased vehicle emissions could affect human health. Potential $PM_{2.5}$ concentrations from traffic associated with the 49ers/Raiders Shared Stadium Variant (Variant 5) were estimated compared against the 0.2 $\mu g/m^3$ action level to determine the potential health risks on receptors attributed to vehicle emissions from the 49ers/Raiders Shared Stadium Variant (Variant 5).

[1294] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Attachment III, September 28, 2009.

Several roadway segments were chosen based on whether Project-related traffic would use these streets to access neighboring freeways and other areas of San Francisco and/or currently or would experience significant truck traffic. The roadways chosen include:

- Third Street
- Innes Avenue/Hunters Point Boulevard/Evans Avenue
- Palou Avenue
- Gilman Avenue/Paul Avenue
- Harney Way
- Jamestown Avenue
- Ingerson Avenue

- With the addition of Variant-related traffic, no receptors along the streets listed above would experience an increase in $PM_{2.5}$ concentrations in excess of the 0.2 $\mu g/m^3$ action level.[1295] Concentrations would not exceed the action level, and as such, impacts would be less than significant, similar to the Project.

Noise and Vibration

As described above, the 49ers/Raiders Shared Stadium Variant land uses will be the same as the Project. However, with the shared stadium, there would be an increase in the number of football games that would occur during the football season. This could result in an event at the stadium every week during the football season. As the footprint of development, the total amount of development, and the land uses provided with the 49ers/Raiders Shared Stadium Variant would be the same as the Project, noise impacts of a 49ers/Raiders Shared Stadium Variant would also be the same as the Project, except with additional noise impacts around the stadium associated with the additional game days.

Construction activities for a 49ers/Raiders Shared Stadium Variant would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction best management practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction best management practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under the 49ers/Raiders Shared Stadium Variant, but not to a less-than-significant level as vibration levels from pile driving activities could be as high

[1295] ENVIRON, *Ambient Air Quality Human Health Risk Assessment: Candlestick Point–Hunters Point Shipyard Phase II Development Plan*, Appendix IV, May 4, 2010.

as 103 VdB for the residential uses within the HPS North District, the CP Center, and South Districts when occupied; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of a 49ers/Raiders Shared Stadium Variant, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with a 49ers/Raiders Shared Stadium Variant, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of a 49ers/Raiders Shared Stadium Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. Measures available to address significant traffic noise increases in these residential areas are limited. The ultimate feasibility and implementation of the noise insulation measures that would be required to reduce roadway noise levels to below the threshold of significance would be dependent on factors that would be beyond the control of the City as the lead agency or the Project Applicant to guarantee. Therefore, this impact would remain significant and unavoidable.

Football games and concerts at the proposed stadium with a 49ers/Raiders Shared Stadium Variant would generate noise that would adversely affect surrounding residents, similar to the Project. Implementation of mitigation measure MM NO-7.1 would ensure that nearby residential uses do not experience temporary increases in ambient noise levels within their homes that would exceed 45 dBA; however, as with the Project, the feasibility and practicality of mitigation measure MM NO-7.1 cannot be determined at this time, this impact would remain significant and unavoidable.

The 49ers/Raiders Shared Stadium Variant site is not located within an airport land use plan area or near a private airstrip. Furthermore, the 49ers/Raiders Shared Stadium Variant does not include an aviation component. Therefore, a 49ers/Raiders Shared Stadium Variant will not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources and Paleontological Resources

Although no fossils have been reported at the HPS Phase II site, the presence of Franciscan sedimentary rocks (shanstone, shale, chert, and greenstone) on the flanks of Hunters Point indicates the possibility of fossils being discovered during construction-related excavation. Additionally, the presence of Bay mud under the fill around Hunters Point also indicates the possibility of fossils being discovered during construction-related excavation. However, mitigation measure MM CP-3a (paleontological resources) and MM CP-2a (human remains) would reduce the effects of construction-related activities to paleontological resources to a less-than-significant level by mitigating for the permanent loss of the adversely affected resources through implementation of a *Paleontological Resources Monitoring and Mitigation Program*. Impacts related to the disturbance of human remains was also found to be less than significant with the incorporation of mitigation measure MM CP-2a (human remains), which requires compliance with all applicable laws related to the discovery of human remains. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact to paleontological resources during construction activities, similar to the Project.

Previous archaeological investigations have shown that prehistoric archaeological sites within the Candlestick Point and HPS Phase II sites tend to be located along the original shoreline. Hunters Point had numerous maritime-related industries, including dry docks and boarding houses. In addition, there were several historically documented large offshore "rocks" that presented navigational hazards. Therefore, it is possible that buried shipwrecks may occur within the HPS Phase II site and construction activities may encounter previously unknown archaeological resources. Candlestick Point was found to have potential archaeological resources resulting from Chinese fishing camps. Similar to the Project, implementation of mitigation measure MM CP-2a (archeological resources) for this Variant would reduce the effects of construction-related activities to potential archaeological resources within the HPS Phase II and Candlestick Point sites to a less-than-significant level by mitigating for the permanent loss of the adversely affected archaeological resources through implementation of the *Archaeological Research Design and Treatment Plan for the Bayview Waterfront Project, San Francisco, California*. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact to archaeological resources during construction activities, similar to the Project.

- Similar to the Project, development with the 4934s/Raiders Shared Stadium Variant would result in the demolition of Buildings 211, 224, 231, and 253, which have been determined eligible for the CRHR and are contributors to the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. As such, this would be a potentially significant impact because the proposed actions would demolish buildings that contribute to a historic district; the impact would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Furthermore, with incorporation of mitigation measure MM CP-1b.1 and MM CP-1b.2 (historic resources), (which requires the preparation of a written and photographic documentation of the potential Hunters Point Commercial Dry Dock and Naval Shipyard Historic District, as identified in the report titled *Bayview Waterfront Plan Historic Resources Evaluation, Volume II: Draft Historic Resources Survey and Technical Report*, July 2009, prepared by Circa Historic Property Development), potential impacts would be reduced to the extent possible. Nonetheless, the impact to historical resources during construction activities of the 49ers/Raiders Shared Stadium Variant would remain significant and unavoidable, similar to the Project.

Operational activities with the 49ers/Raiders Shared Stadium Variant would include the day-to-day activities typical of residential, office, commercial, and stadium use. However, this would not have the potential to adversely disturb paleontological, archaeological, or historical resources. Therefore, the 49ers/Raiders Shared Stadium Variant would result in no impact to these resources, similar to the Project.

Hazards and Hazardous Materials

The footprint of development for a 49ers/Raiders Shared Stadium Variant would be the same as for the Project. As such, impacts from construction of this Variant would be the same as the Project.

Construction activities associated with the 49ers/Raiders Shared Stadium Variant would: disturb soil and/or groundwater; result in the handling, stockpiling, and transport of soil; involve demolition or renovation of existing structures that could include asbestos-containing materials, lead-based paint, PCBs, or fluorescent lights containing mercury; expose construction workers to hazardous materials; be a source of hazardous air emissions within one-quarter mile of an existing or planned school; and encounter soils

or groundwater that contains contaminants from historic uses that could pose a human health or environmental risk if not properly managed. Each of these impacts for the 49ers/Raiders Shared Stadium Variant would be similar to the Project, and would be reduced to a less-than-significant level with implementation of the identified mitigation measures (MM HY-1a.2, MM HZ-1a, MM HZ-1b, MM HZ-2a.1, MM HZ-2a.2, MM HZ-5a, MM HZ-9, MM HZ-10b, MM HZ-12, MM HZ-15, MM HY-1a.1, MM HY-1a.3, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4).

Construction of the 49ers/Raiders Shared Stadium Variant would require improvements to existing utility infrastructure and installation of new underground utilities, but this would not expose construction workers, the public, or the environment to unacceptable levels of hazardous materials. However, with the implementation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, which require remediation of any contaminated soils, the hazards risk from potential exposure to contaminated soil or groundwater during construction would be reduced to a less-than-significant level, similar to the Project. In addition, mitigation measure MM HZ-2a.2 requires the preparation of a site-specific health and safety plan, which would further ensure that all risks to workers, residents, or the public would be reduced to less than significant, the same as for the Project.

The 49ers/Raiders Shared Stadium Variant would require pile supports for the residential towers, the same as the Project. This construction activity could result in groundwater contamination from disturbed soils. Mitigation measure MM HZ-5a would reduce this impact by requiring a foundation support piles installation plan, which would verify that pilot boreholes for each pile would be drilled through the artificial fill materials so the piles can be installed without damage or misalignment and to prevent potentially contaminated fill materials from being pushed into the underlying sediments or groundwater. With implementation of this mitigation measure, the impact from potential groundwater contamination would be reduced to a less-than-significant level, the same as for the Project.

Shoreline improvements would occur under the 49ers/Raiders Shared Stadium Variant the same as for the Project. Shoreline improvements would require concurrence of BCDC, San Francisco RWQCB, and USACE. That permit would contain numerous conditions to ensure that the construction activities are conducted in a manner that is protective of aquatic resources. Mitigation measure MM HZ-10b requires that all shoreline activities that could affect sediment (or in the case of the Navy-installed cover and riprap at Parcel E/E-2) be conducted in accordance with agency-approved remedial design documents, applicable health and safety plans, DCPs, or any other documents or plans required under applicable law or laws, including but not limited to applicable requirements shown in Table III.K-2. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts. For Candlestick Point, impacts would be mitigated through mitigation measures MM HY-1a.1 and MM HY-1a.2. With implementation of these mitigation measures, along with applicable regulations and permits, potential impacts related to exposure to hazardous materials releases from contaminated sediments that could be disturbed during proposed shoreline improvements would be reduced to a less-than-significant level for the 49ers/Raiders Shared Stadium Variant, the same as for the Project.

Similar to the Project, remediation activities conducted on behalf of the City or developer in conjunction with development activities at HPS Phase II parcels transferred prior to completion of remediation in an "early transfer" would disturb soil and/or groundwater that may contain contaminants from historic uses.

The identified mitigation measure (MM HZ-12) would require the SFDPH to ensure that before development occurs, the Agency or the developer and their contractors have incorporated all applicable requirements into remedial design documents, work plans, health and safety plans, DCPs and any other document or plan required under the AOC or other applicable law, as a condition of development. As a result of these controls and mitigation measure, the potential impact of exposure to hazardous materials during remediation activities conducted on behalf of the Agency or the developer in conjunction with development of HPS Phase II under the 49ers/Raiders Shared Stadium Variant would be reduced to less-than-significant levels.

In addition to uncovering hazardous materials within the existing buildings, construction and grading activities associated with the 49ers/Raiders Shared Stadium Variant could disturb soil or rock that is a source of naturally occurring asbestos, which could present a human health hazard. However, with the implementation of mitigation measure MM HZ-15, which requires preparation of an asbestos dust mitigation plan, this impact would be reduced to a less-than-significant level, similar to the Project.

As with the Project, the Bret Harte Elementary School and Muhammad University of Islam elementary schools are located within one-quarter mile of the development area of the 49ers/Raiders Shared Stadium Variant. Consistent with the discussion above, the 49ers/Raiders Shared Stadium Variant could uncover asbestos-containing materials (naturally or in existing building materials) or other hazardous materials during construction, consistent with the Project. However, with incorporation of mitigation measures MM HZ-1a, MM HZ-1b, and MM HZ-2a.1, and MM HZ-15, any impacts to these schools would be reduced to a less-than-significant level, similar to the Project.

After development of the 49ers/Raiders Shared Stadium Variant, periodic maintenance could require excavation of site soils to maintain or replace utilities, repair foundations, or make other subsurface repairs which could expose hazardous materials. Implementation of mitigation measures MM HZ-1a and HZ-1b would require remediation of any contaminated soils pursuant to the appropriate regulations. MM HZ-2a.1 would require the development of an unknown contaminant contingency plan to describe procedures to follow in the event unexpected contamination is encountered during construction activities, including procedures for ensuring compliance with the above laws and regulations. Additionally, mitigation measure MM HZ-2a.2, would require the preparation and implementation of a site-specific HASP in compliance with federal and state OSHA regulations and other applicable laws. The general requirement of mitigation measure MM HZ-9 would require that the Agency or its contractor or Project Applicant shall comply with all requirements incorporated into remedial design documents, work plans, health and safety plans, dust control plans, and any other document or plan required under the Administrative Order of Consent for any properties subject to early transfer (prior to full Navy remediation). To reduce this impact related to exposure to hazardous materials releases that have not been fully remediated at HPS Phase II, mitigation measure MM HZ-9 also requires that all work on the Yosemite Slough bridge would comply with Navy work plans for construction and remediation on Navy-owned property. Implementation of these mitigation measures would reduce this impact to a less-than-significant level, same as for the Project.

The 49ers/Raiders Shared Stadium Variant would provide for 8 more game days than the Project. This would result in the same amount of hazardous materials being used compared to the Project. The 49ers/Raiders Shared Stadium Variant would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial

risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, the same as for the Project. Maintenance products anticipated under the 49ers/Raiders Shared Stadium Variant would be incrementally small, and would not substantially increase the risk from handling these materials. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. The 49ers/Raiders Shared Stadium Variant would comply with applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials. Impacts would be less than significant, similar to the Project.

Hazardous materials would routinely be transported to, from, and within the Project, and small amounts of hazardous waste would be removed and transported off site to licensed disposal facilities. Compliance with federal, state, and local regulations would ensure that the impact would be less than significant, the same as for the Project.

Daily operations under the 49ers/Raiders Shared Stadium Variant could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment but it would not pose a human health risk and/or result in an adverse effect on the environment. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the City. Impacts would be less than significant, similar to the Project.

The 49ers/Raiders Shared Stadium Variant site is not located within the San Francisco Airport Land Use Policy Plan Area and the 49ers/Raiders Shared Stadium Variant would not result in a safety hazard from airport operations for people residing or working in the area. The site is not located within any other airport land use plan area. The 49ers/Raiders Shared Stadium Variant site is also not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working at the Project site. Similar to the Project, operation of the R&D Variant would not expose people or structures to a significant risk of loss, injury, or death involving fires or conflict with emergency response or evacuation plans.

Geology and Soils

Since the 49ers/Raiders Shared Stadium Variant would be developed exactly as the Project, impact significance determinations made for the Project in Section III.L (Geology and Soils) of this EIR would be the same with this Variant.

Construction

As with the Project, construction activities, such as grading and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. The erosion hazard rating for the local soils in the Project site is slight to severe. Requirements to control surface soil erosion during and after construction with the 49ers/Raiders

Shared Stadium Variant would be implemented through the requirements of mitigation measure MM HY-1a.1 (SWPPP) and adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, would be avoided or reduced to a less-than-significant level, similar to the Project.

In addition to the potential for soil erosion, construction activities would have the potential to affect groundwater levels. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by mitigation measure MM GE-2a (dewatering), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact, similar to the Project.

At the Alice Griffith Public Housing site and the Jamestown area, the removal of bedrock through heavy equipment methods or controlled rock fragmentation activities would have the potential to fracture rock adjacent to the excavation, thereby destabilizing it and possibly causing settlement of structures above it. With implementation of those techniques, ground surface and building damage monitoring, as specified in the SFBC and required by mitigation measure MM GE-3, vibration from controlled rock fragmentation in the area would not cause unacceptable settlement or damage at adjacent or nearby properties would occur. Consequently, settlement hazards related to controlled rock fragmentation would be less than significant, similar to the Project.

Operation

Impacts with respect to geology and soils conditions with the 49ers/Raiders Shared Stadium Variant would be substantially similar to those of the Project.

The potential for exposure to adverse effects caused by seismic groundshaking exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would require design-level geotechnical investigations that would include site-specific seismic analyses to evaluate the peak ground accelerations for design of Variant structures and the Yosemite Slough bridge, as required by the SFBC and Caltrans. Implementation of these mitigation measures would ensure that potential impacts from groundshaking would be less than significant, similar to the Project.

The potential for adverse effects caused by seismically induced ground failure such as liquefaction, lateral spreading, and settlement exists at the Project site. Mitigation measures MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, and MM GE-5a would require design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of 49ers/Raiders Shared Stadium Variant structures, as required by the SFBC through review by DBI. It is anticipated that DBI would employ a third-party engineering geologist and/or civil engineer to form a GPRC. The GPRC would complete the technical review of proposed site-specific structural designs prior to building permit approval. The structural design review would ensure that all necessary mitigation methods and techniques were incorporated in the design for 49ers/Raiders Shared Stadium Variant foundations and structures to reduce potential impacts from ground failure or liquefaction a less-than-significant level, similar to the Project.

With the 49ers/Raiders Shared Stadium Variant, the potential for adverse effects due to seismically induced landslides exists at the Project site. Implementation of mitigation measures MM GE-6a and MM GE-4a.2 would ensure compliance with the SFBC and any special requirements of the HUD for compliance

documentation and would reduce potential impacts from landslides a less-than-significant level, similar to the Project.

With the 49ers/Raiders Shared Stadium Variant, more game days would occur, and no structural development difference would occur. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact due to shoreline stability, similar to the Project.

The potential for adverse effects caused by landslides exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual 49ers/Raiders Shared Stadium Variant elements, as specified in mitigation measure MM GE-6a. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of this mitigation, the 49ers/Raiders Shared Stadium Variant's impact with regard to landslides would be less than significant, similar to the Project.

The potential for adverse effects due to settlement exists at the Project site. However, design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-5a, MM GE-4a.2, and MM GE-4a.3 would ensure compliance with the provisions of the SFBC and would reduce the impact a less-than-significant level, similar to the Project.

The potential for adverse effects caused by expansive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-10a, MM GE-4a.1, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Project structures from expansive soils a less-than-significant level, similar to the Project.

With the 49ers/Raiders Shared Stadium Variant, the potential for adverse effects caused by corrosive soils exists at the Project site. Design-level geotechnical investigations must evaluate the structural design, as required by the SFBC through review by DBI. Implementation of mitigation measures MM GE-11a, MM GE-4a.2, and MM GE-4a.3 would avoid or reduce the impact to Project structures from corrosive soils a less-than-significant level, similar to the Project.

Fault rupture hazards are unlikely. Ground rupture occurs most commonly along preexisting faults. No known active faults cross the Hunters Point shear zone, making hazards from fault rupture unlikely with the 49ers/Raiders Shared Stadium Variant.[1296] Therefore, there would be no impact caused by surface fault rupture, similar to the Project.

All development with the 49ers/Raiders Shared Stadium Variant would be connected to the City's existing wastewater treatment and disposal system and would not involve the use of septic tanks or alternative wastewater disposal systems. No impact would occur, similar to the Project.

The R&D Variant would not substantially change site topography or affect unique geologic features, and would have no impact on such features, similar to the Project.

[1296] GTC, 2005.

Hydrology and Water Quality

The footprint and amount of development for the 49ers/Raiders Shared Stadium Variant would be the same as for the Project. As such, impacts from construction of the 49ers/Raiders Shared Stadium Variant would be similar to the Project.

Construction

Construction activities associated with a 49ers/Raiders Shared Stadium Variant would not cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With implementation of mitigation measures MM HY-1a.1 (preparation of a SWPPP for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

Construction activities associated with the 49ers/Raiders Shared Stadium Variant would include excavation for building foundations and underground utilities which could require short-term and/or long-term dewatering of the affected areas. As the total amount of open space under the 49ers/Raiders Shared Stadium Variant would remain the same as under the Project, the amount of permeable surface would also remain the same. Therefore, the 49ers/Raiders Shared Stadium Variant would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the 49ers/Raiders Shared Stadium Variant site and thus no streams or rivers would be altered by construction activities. During construction of the 49ers/Raiders Shared Stadium Variant, the existing drainage patterns within the area would generally be preserved. Construction activities associated with the 49ers/Raiders Shared Stadium Variant would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on site or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated the 49ers/Raiders Shared Stadium Variant, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of a SWPPP), impacts would be less than significant, similar to the Project.

Operation

Operation of the 49ers/Raiders Shared Stadium Variant Operation of the Housing Variant would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the

Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of the R&D Variant. In addition, this variant would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As extent of impervious surfaces for the 49ers/Raiders Shared Stadium Variant would the same as with the Project, impacts would be the same as those with the Project.

Implementation of the 49ers/Raiders Shared Stadium Variant would not utilize groundwater as a source of water supply, substantially deplete groundwater supplies, or substantially interfere with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and this impact would be less than significant, similar to the Project.

Operation of a 49ers/Raiders Shared Stadium Variant could alter the existing drainage pattern of the site, but would not alter the course of an existing stream or river or result in substantial erosion, siltation, or flooding on-site or off-site, similar to the project. Implementation of the 49ers/Raiders Shared Stadium Variant would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of a 49ers/Raiders Shared Stadium Variant would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce impact to a less-than-significant level, similar to the Project.

Implementation of a 49ers/Raiders Shared Stadium Variant would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, the 49ers/Raiders Shared Stadium Variant would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

The footprint of development for 49ers/Raiders Shared Stadium Variant would be the same as for the Project, and the area subject to ground disturbance would be the same as the Project. Both construction and operational impacts to biological resources would be substantially similar to the Project, as discussed below, because the type of development and associated construction activities are substantially the same. Additionally, operational activities are the same as those under the Project, with the exception of the new stadium being home to both the San Francisco 49ers and the Oakland Raiders.

Construction

Development of the 49ers/Raiders Shared Stadium Variant would not have a substantial adverse effect, either directly or through habitat modifications, on any common species or habitats since ecological enhancements and measures to avoid and minimize impacts to common vegetation communities and wildlife species would be proposed, similar to the Project. Impacts would be less than significant, similar to the Project.

Development of the 49ers/Raiders Shared Stadium Variant could have a substantial adverse effect, either directly or through habitat modifications, on sensitive natural communities or species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce the effects on eelgrass, and the sensitive or special-status fish species that could occupy these areas by surveying for and avoiding this habitat. Mitigation measures MM BI-6a.1, MM BI-6a.2, and MM BI-6b would require surveys for special-status and nesting avian species and implement impact-avoidance measures such as construction buffers to ensure that the loss or take of these species would not occur.

Similar to the Project, the Draft Parks, Open Space, and Habitat Concept Plan would identify ecological enhancement measures that would include the restoration and management of suitable raptor foraging habitat. To provide a mechanism by which implementation of these enhancements would be ensured, mitigation measure MM BI-7b would be implemented to ensure that specific standards related to the enhancement of raptor foraging habitat would occur. Therefore, a net increase in the quality of raptor foraging habitat would result, similar to the Project, and, with mitigation, the overall effect on raptors is expected to be beneficial. Mitigation measure MM BI-9b would reduce the effects of pile driving-related activities to fish and marine mammals by recommending the type of piles to use to minimize sound impacts; providing for an alternative method of installation to minimize sound impacts; requiring installation during an agency-approved construction window when fish are least likely to be present to avoid the bulk of potential impacts; and requiring a construction monitor to ensure compliance with all measures, including sound monitoring. Construction activities could impact designated critical habitat for green sturgeon and Central California Coast steelhead; however, compensatory mitigation for lost aquatic habitat as described in mitigation measures MM BI-4a.1 and MM BI-4a.2 would be implemented to minimize impacts to wetlands, aquatic habitats, and water quality during construction. Overall adverse effects would be less than significant, similar to the Project. Mitigation measures MM BI-4a.1, MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12a.1, MM BI-12a.2, MM BI-12b.1, and MM BI-12b.2 would reduce potentially significant impacts to Essential Fish Habitat to less-than-significant levels, similar to the Project. Ecological design features described in the Draft Parks, Open Space, and Habitat Concept Plan would result in increased habitat for western red bats, and impacts to this species would be less than significant.

Development of the 49ers/Raiders Shared Stadium Variant could have a substantial adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. With implementation of mitigation measures MM BI-4a.1 and MM BI-4a.2, potential adverse effects of the Project to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project.

Development of the 49ers/Raiders Shared Stadium Variant would not conflict with the natural resource protection policies of the General Plan; however, it could result in the disturbance or loss of trees that are protected by the City's Urban Forestry Ordinance and Section 143 of the *Planning Code*. Mitigation measure MM BI-14a would ensure that development does not result in conflicts with these policies by requiring preservation of street trees, trees that meet the size specification of significant trees, replacement of large trees that are removed, and the planting of street trees, consistent with *Planning Code* Section 143. In addition, mitigation measure MM BI-7b includes the planting of approximately 10,000 net new trees. With implementation of mitigation measures MM BI-14a and MM BI-7b, the 49ers/Raiders Shared Stadium Variant would not result in a conflict with City policies designed to protect urban streetscape through the planting of street trees, similar to the Project, and overall impacts would be beneficial.

Operation

Impacts to native oysters and EFH would be less than significant as removed hard structures would be replaced with approximately equal amounts of suitable habitat along the shoreline or the new breakwater. Implementation of mitigation measure MM BI-18b.1 would reduce the effects of marina operational activities to oysters, and mitigation measure MM BI-18b.2 would mandate the application of BMPs to control the distribution of sediments disturbed by the dredging activities to reduce water quality impacts to oysters. Mitigation measures MM BI-19b.1 and MM BI-19b.2 would reduce dredging and contamination impacts to EFH. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Development of the 49ers/Raiders Shared Stadium Variant could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site (eelgrass beds). Mitigation measures MM BI-5b.1 through MM BI-5b.4 would reduce effects on eelgrass by surveying for and avoiding this habitat. Mitigation measures MM BI-20a.1 and MM BI-20a.2 would reduce the effects of operational activities related to tall structures and increased lighting to migrating species to less-than-significant levels by incorporating design features that would help minimize bird strikes, including using operational methods to reduce the effects of new lighting towers. With implementation of the identified mitigation measures, impacts would be reduced to a less-than-significant level, similar to the Project.

Implementation of the 49ers/Raiders Shared Stadium Variant would be consistent with the biological resources protection policies of the *City of San Francisco General Plan*, and with implementation of mitigation measure MM BI-14a, development would be constructed in a manner consistent with policies of the Urban Forestry Ordinance and *Planning Code* Section 143. Consequently, the operation of the Utilities Variant would not conflict with any local policies or ordinances protecting biological resources, and there would be no impact.

Public Services

Construction

Police and Fire Services

Similar to the Project, access to the 49ers/Raiders Shared Stadium Variant site during construction would be maintained by implementation of a construction management traffic plan (CMTP) MM TR-1. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the area would be implemented.

Similar to the Project, construction of the 49ers/Raiders Shared Stadium Variant would not result in increased demand on police protection services, as demands on the SFPD during construction would be supplemented by private security (as required by mitigation measure MM PS-1 [site security measures during construction]), and construction areas would be secured through the installation of fencing and gates.

Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact to police protection and fire services during construction. As construction of the 49ers/Raiders Shared Stadium Variant would not impact SFPD or SFFD response times upon implementation of a CMTP. These impacts would be similar to the Project.

Schools and Library Facilities

Construction of the Project would not result in impacts to the SFUSD or the San Francisco Public Library System. SFUSD or library facilities are not located on the Project site. All area school and library services would be available to the community throughout the duration of Project construction. As such, since construction of the 49ers/Raiders Shared Stadium Variant would be similar to construction of the Project, no impact to school or library services during construction of the Variant would occur. These impacts are the same as those identified for the Project.

Operation

Police Protection Services

Development with the 49ers/Raiders Shared Stadium Variant would have similar impacts to police protection services as development with the Project. Although the 49ers/Raiders Shared Stadium Variant would double the number of NFL events per year (from 12 to 20), response times and service staffing ratios are calculated on a daily basis, and, therefore, twice the number of days with an acceptable levels of service still results in less-than-significant impacts. Response times are determined per event where police response is required and, therefore, is not degraded by the number of days where potential response would be required. Therefore, since operational impacts to police protection services were found to be less than significant for the Project, impacts to police protection services for the 49ers/Raiders Shared Stadium Variant would also be less than significant.

Fire Protection Services

Development with the 49ers/Raiders Shared Stadium Variant would have similar impacts to fire services as development with the Project. Although the 49ers/Raiders Shared Stadium Variant would double the number of NFL events per year (from 12 to 20), response times and service staffing ratios are calculated on a daily basis, and, therefore, twice the number of days with acceptable levels of service still results in less-than-significant impacts. Response times are determined per event where fire/emergency medical service response is required and, therefore, is not degraded by the number of days where potential response would be required. Therefore, since operational impacts to these services were found to be less than significant for the Project, impacts to these services for the 49ers/Raiders Shared Stadium Variant would also be less than significant.

Building Safety

All new buildings must meet standards for emergency access, sprinkler, and other water systems, as well as all other requirements specified in the *San Francisco Fire Code*, which would help minimize demand for future fire protection services. Plan review of all structures for compliance with *San Francisco Fire Code* requirements would minimize the potential for fire-related emergencies by providing on-site protective features, reducing the demand for fire protection services.

Response Time

Construction of a new SFFD facility on land designated for community serving uses on the Project site, along with the provision of additional firefighters and on-going fire protection operations, would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. The Applicant has designated 5.3 acres of community-serving uses in HPS Phase II, including 0.5 acre of which have been designated for a new SFFD facility.

These uses have been anticipated as part of the 49ers/Raiders Shared Stadium Variant and the impacts of their construction are evaluated in this EIR. Construction activities associated with proposed public facilities are considered part of the overall Project. A discussion of project-related construction impacts, including those associated with the construction of public facilities, is provided in the applicable sections of this EIR, including Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M. Construction impacts would be temporary. While it is likely that construction of the various public facilities would not result in significant impacts (either individually or combined), construction of the entire development program, of which the public facilities are a part, would result in significant and unavoidable impacts related to construction noise and demolition of an historic resource; all other construction-related impacts would be less than significant (in some cases, with implementation of identified mitigation). Refer to Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, and Section III.M for the specific significance conclusions for construction-related effects.[1297] As such, the construction impacts associated with a new SFFD facility on the Project site have been addressed in this EIR. Therefore, similar to the Project, the development of this Variant would not require new or physically

[1297] The impact statements provided in each technical section of the EIR differentiate between construction impacts and operational or development impacts, and all identified mitigation measures are contained in the impact analysis. In addition, Table ES-2 in the Executive Summary of this EIR also summarizes all impact statements, the level of significance before mitigation, any identified mitigation measures, and the level of significance after mitigation.

altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is less than significant.

Schools

Operational impacts to schools would be similar to the Project because the number of dwelling units anticipated would be the same. Therefore, the number of school aged children that would require adequate school services would be the same as with the Project. Impacts from the 49ers/Raiders Shared Stadium Variant on schools would be less than significant, similar to the Project.

Library Facilities

Operational impacts to libraries would be similar to the Project because the same number of dwelling units anticipated would be the same. Therefore, the service population for the existing library facilities would be the same as with the Project. Similar to the Project, library branches that currently serve the area including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2010), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less than significant operational impact to library services, similar to the Project.

Recreation

Development with the 49ers/Raiders Shared Stadium Variant would be similar to the Project. The Shared Stadium Variant would include the construction and improvement of new parks, recreational facilities, and open space. At buildout of this Variant, approximately 337.5 acres of parks, open space, and recreational uses would be provided, as described in Table IV-1, which is about 0.5 acre more than proposed with the Project. The Sports Field Complex with the Shared Stadium Variant would be the same as the Project, which is 91.6 acres; however, a total of 148.6 acres of parkland would be provided, about 0.5 acre more than proposed with the Project.

Construction impacts related to recreational facilities would be the substantially the same as those identified with the Project because the construction activities would be substantially similar, with the Shared Stadium Variant requiring slightly more construction due to the provision of about 0.5 acres more of parkland.

The Shared Stadium Variant would have the same number of housing units as proposed with the Project, thereby resulting in the same residential population of 24,465, although 0.5 acres more of parkland would be provided. Operational impacts are determined based on a ratio of acres of parkland per resident. Currently, the City provides approximately 7.1 acres of parkland per thousand residents, and the standard used in Section III.P assumes a ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet the demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. The parkland-to-population ratio associated with the Shared Stadium Variant would be 13.7, which is the same as the Project. The Shared Stadium Variant ratio would be considerably higher than the ratio of 5.5 acres of parkland per thousand residents, which is considered sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of further facilities. Impacts would be less than significant.

The timing of Shared Stadium Variant development could result in a temporary increase in the use of parks, recreational facilities, and open space in a manner that would cause or accelerate the substantial physical deterioration or degradation of facilities if the development of residential and/or employment-generating uses were to occur in advance of the development of park and recreational facilities. The conceptual development plan for this Variant would result in the development of residential units and parks during all of four stages of development. Table III.P-3 (Residential Units and Park Acreage Provided during Each Stage of Development) outlines the number of residential units and the acreage of parkland provided during each stage of development, as well as the resulting park-to-population ratio for residents of the Project site (even if developed under the Shared Stadium Variant). As this table indicates, the park-to-population ratio would not drop below 13.8 acres per 1,000 population at any time during the four stages of development, which exceeds the benchmark of 5.5 acres of parkland per 1,000 population. Adequate parkland would be provided during each stage of development.

However, during a given phase, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed, and a less-than-significant impact would result.

A Technical Memorandum was prepared to study wind conditions at a launch site at CPSRA (in The Neck area) and in a 55-acre portion of the Bay south of the launch site. The study found that development in the cumulative scenario, which includes development at the Project site (even if under the Shared Stadium Variant), generally results in wind speed changes near the shoreline (generally within 300 feet) ranging from no change to a 10 to 20 percent decrease in wind speed. Approximately 7 acres near the shoreline would experience a decrease of 10 to 20 percent in wind speed; approximately 36 acres of the Bay would experience a decrease of five to 10 percent; and approximately 12 acres of the Bay would experience a decrease of less than five percent. The majority of the windsurfing test area (as identified in the Technical Memorandum) would not be substantially affected (e.g., a 10 percent decrease or less in wind speed). Because this Variant is the same as the Project in terms of development amounts and locations, it would not significantly and adversely affect existing windsurfing opportunities at the CPSRA. A less-than-significant impact would occur, and no mitigation is required.

In summary, impacts resulting from the Shared Stadium Variant would be substantially similar to the Project.

Utilities

Implementation of the Shared Stadium Variant would increase demand for water treatment, which could be accommodated within existing water treatment facilities operated by the SFPUC, and impacts would be less than significant. As the same amount of development would occur with the Shard Stadium Variant as with the Project, the demand for water treatment would be the same, and impacts would be similar to the Project.

As with the Project, beginning in 2025, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with the Shared Stadium Variant. With the implementation of the WSAP and RWSAP during multiple dry-year periods, which could include voluntary rationing or other water conservation strategies, existing and projected future water supplies

could accommodate estimated future water demand, including the Project-related demand. As discussed in the WSA, the SFPUC has approved and has made substantial progress towards the implementation of the water facility improvement projects identified in the WSIP. The SFPUC has received voter approval to fund the Phased WSIP program and has initiated bond sales to fund implementation of individual projects, which are in various stages of implementation, including subsequent environmental review, design, or construction.[1298] Thus, there is substantial evidence that the SFPUC would implement the Phased WSIP facility projects described above, including the local water supply projects.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects, and various conservation efforts. The proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco.[1299,1300] Recycled water will primarily be used for landscape irrigation, toilet flushing, and industrial purposes. The Harding Park Project has completed environmental review, and the Westside Project is expected to begin environmental review in late 2009 or early 2010. The WSIP contains funding for planning, design, and environmental review for the San Francisco Eastside Recycled Water Project. The local water supply improvement projects were approved as part of the Phased WSIP and are included in the WSIP funding program. The SFPUC has initiated planning, environmental review, and design of several recycled water and groundwater projects and conservation programs are in place. Thus, there is substantial evidence that the additional water provided by those projects would be available to supplement retail water supplies.

As noted above, the SFPUC adopted the Phased WSIP, which phased implementation of the water supply program to provide an additional 20 mgd of supply to meet projected demand through 2018 and requires the SFPUC to re-evaluate water demands and water supply options by December 31, 2018 through 2030 to meet projected demand. The Shared Stadium Variant would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, and this impact is less than significant, similar to the Project.

Wastewater

Construction impacts of the 49ers/Raiders Shared Stadium Variant would be similar to the Project due to their similar development programs. Existing wastewater infrastructure within the Project site is aging and in poor condition in some locations as a result of the intrusion of saline groundwater from the San Francisco Bay, which corrodes pipes, and the settling of fill material that underlies portions of the area, which has resulted in pipeline stress at some locations.[1301] Similar to the Project, the 49ers/Raiders Shared Stadium Variant would replace existing wastewater conveyance infrastructure within the HPS Phase II and Candlestick Point areas to adequately serve development with this Variant.

[1298] Per the *Water System Improvement Program Quarterly Report, Q4, FY 2008/2009* (dated August 20, 2009), (prepared by the SFPUC), as of July 1, 2009, two (2) projects are in the Planning Phase, eleven (11) projects are in the Design Phase, six (6) projects are in the Bid and Award Phase, five (5) projects are in the Construction Phase, two (2) projects in the Close-Out Phase, eight (8) projects are completed, one (1) project has not been initiated, and eleven (11) projects have multiple active phases. Available at: http://sfwater.org/Files/Reports/01_RW_Program_Summary.pdf Accessed September 28, 2009.
[1299] San Francisco Planning Department, Final Program Environmental Impact Report, Water Supply Improvement Program, October, 2008.
[1300] SFPUC, Urban Water Management Plan, 2005.
[1301] Winzler & Kelly Consulting Engineers, *Candlestick Point/Hunters Point Shipyard Infrastructure Concept Report*, October 26, 2009.

As shown in Table IV-36 (49ers/Raiders Shared Stadium Variant Wastewater Generation), the 49ers/Raiders Shared Stadium Variant would result in the generation of approximately 2.03 mgd of wastewater, an increase of 0.85 mgd of wastewater over the Project (refer to Table IV-37 [Sewer Trunk Capacity and Shared Stadium Variant Maximum Peak Flows] for peak flows). The 49ers/Raiders Shared Stadium Variant would have an increase in wastewater generation when compared to the Project since the stadium would theoretically be used 40 days instead of 32 days during each NFL season.

Table IV-36 49ers/Raiders Shared Stadium Variant Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed As % of Water Demand (or as otherwise specified)*	*Candlestick Point (mgd)*	*Hunters Point (mgd)*	*Total Shared Stadium Variant (mgd)*
Residential	95%	1.08	0.36	1.44
Regional Retail	57%	0.05	0	0.05
Neighborhood Retail	57%	0.01	0.01	0.02
Office	57%	0.02	0.01	0.03
Community Uses	57%	0.01	0.01	0.02
Research and Development	57%	0	0.41	0.41
Hotel	57%	0.03	0	0.03
Artist Studios	95%	0	0.02	0.02
Football Stadium	95%	0	0.02	0.02
Performance Venue	95%	0.01	0	0.01
Total		***1.21***	***0.84***	***2.05***

SOURCE: Arup, October, 2009 and PBS&J, October, 2009

Table IV-37 Sewer Trunk Capacity and Shared Stadium Variant Maximum Peak Flows

Sewer Trunk	*Design Capacity (gpm)*	*Existing Average Dry-Weather Flow[a] (gpm)*	*Existing Maximum Peak Dry-Weather Flow[b] (gpm)*	*Variant Contribution—Maximum Peak Dry-Weather Flow[c] (gpm)*	*Remaining Peak Flow Capacity (gpm) With Shared Stadium Variant*
Candlestick tunnel sewer	34,722	1,736	5,208	2,520.8	26,993.2[e]
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	1,750	69,082[f]

SOURCE: Bayside Operations Plan, 2002.

a. Calculated as existing average dry-weather flow in mgd/24 hours/60 minutes 1,000,000.
b. Calculated as existing average flow in gpm x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in mgd/24 hours/60 minutes X 1,000,000 X peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses at Candlestick Point (including Alice Griffith Public Housing, the RV park, and the stadium) that will be demolished on site and that currently contribute to the Candlestick tunnel sewer. Therefore, the actual remaining peak flow capacity of the Candlestick tunnel sewer with the Project will be somewhat greater than 28,035 gpm.
f. Calculated as design capacity less existing maximum peak flow less Project maximum peak flow, all in gpm. This calculation does NOT take credit for the existing uses on the HPS Phase II site that will be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with the Project will be somewhat greater than 69,853 gpm.

Similar to the Project, since the existing conveyance infrastructure could accommodate additional flows from the development in addition to existing flows, even during periods of peak flows, no expansion of the off-site wastewater conveyance lines would be required as a result of the 49ers/Raiders Shared Stadium Variant development.

Stormwater flows from the Candlestick Point site would be the same with the 49ers/Raiders Shared Stadium Variant as the Project, and would not increase. Therefore, treatment of stormwater from Candlestick Point would also be the same as the Project. Stormwater from the Project site is collected and discharged to the Bay via a separate stormwater system, which does not contribute any flows to the Combined Sewer System during wet weather. With development of the49ers/Raiders Shared Stadium Variant, stormwater would continue to be collected and treated in a separate stormwater system, and stormwater runoff would not contribute to the Combined Sewer System during wet weather. Although development with the49ers/Raiders Shared Stadium Variant site would result in a slight net increase in wastewater flows of 0.85 mgd, the additional flows would represent less than 0.1 percent of the remaining treatment capacity of the SWPCP. The increase in wastewater generation with the 49ers/Raiders Shared Stadium Variant would incrementally contribute to the total amount of wet-weather flows that are collected and treated at the SWPCP, the NPWWF, and the Bayside Wet Weather Facilities. When the combined storage and treatment capacity of those facilities are exceeded, wastewater could be discharged, along with other wet-weather flows from the combined system, via the CSOs located around the perimeter of San Francisco. Mitigation measure MM UT-3a would ensure that there would be no net increase in wet-weather flows in the Combined Sewer System as a result of the Project that could result in a temporary increase in CSO volume. During wet weather, the temporary retention or detention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project would ensure that there would be no increase in the likelihood of a CSO event as a result of the Project. The impact would be less than significant, similar to the Project.

The NPDES permit system requires that all existing and future municipal and industrial discharges to surface waters within the City be subject to specific discharge requirements. Wastewater from the 49ers/Raiders Shared Stadium Variant would be treated at the SWPCP wastewater treatment plant and the SFPUC, which operates the SWPCP wastewater treatment plant, and is required to comply with waste discharge requirements (WDRs) set by the RWQCB, which specify the allowable levels of pollutants in discharges from the facility. Compliance with any applicable WDRs, as monitored and enforced by the SFPUC, would ensure that the 49ers/Raiders Shared Stadium Variant would not exceed the applicable wastewater treatment requirements of the RWQCB, and this impact would be less than significant, similar to the Project.

Solid Waste

With the 49ers/Raiders Shared Stadium Variant, construction wastes, including demolition and hazardous wastes, would be similar to that generated with the Project. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste stream that is ultimately taken to a landfill. Incorporation of mitigation measures MM UT-5a (Construction Waste Diversion Plan) would ensure that solid waste impacts during construction are reduced to a less-than-significant level.

As shown in Table IV-38 (49ers/Raiders Shared Stadium Variant Projected Solid Waste Generation), the 49ers/Raiders Shared Stadium Variant would result in approximately 22,411.9 tons of waste per year at full build-out, similar to the Project. The increase in solid waste generation associated with the 49ers/Raiders Shared Stadium Variant development would not be substantial in the context of citywide solid waste infrastructure demand. Development with the 49ers/Raiders Shared Stadium Variant would increase yearly production of solid waste by 585 tons per year as a result of twice as many NFL events annually.

Table IV-38 49ers/Raiders Shared Stadium Variant Projected Solid Waste Generation

Land Use	*Generation Factor*	*Total Tons*
Residential	5.653/Unit	29.67
Retail	0.02600411 lbs/sf	11.50
Office	0.006 lbs/sf	0.45
Hotel	0.0108 lbs/sf	0.81
R&D	0.006 lbs/sf	75.0
Performance Venue	2.23 lbs/seat	76.94
Community Services	0.006 lbs/sf	0.3
Total		***194.67***

SOURCE: PBS&J 2009; Generation Factors from Arup, *Carbon Footprint Report*, March 24, 2009.

Landfill capacity is a dynamic metric dependent on the amount of solid waste that requires disposal (and the effectiveness of source reduction and recycling methods), the permitted capacity of the landfills, and the number of landfills that can accommodate solid waste. The City has a contract with Altamont Landfill to accept the City's waste through 2014. In 1988, the City of San Francisco entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste. Through August 1, 2009, the City has used 12,579,318 tons of this capacity. The City projects that the remaining capacity would be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[1302]

The City has issued a Request for Qualifications to solicit bids for a new contract to accommodate the City's disposal capacity beyond the expiry of the current agreement. The City has selected three landfills that have the capacity to meet the City's future needs and is in the final stages of the selection process that will result in an agreement for ratification by the Board of Supervisors no later than early 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs.

As noted, at current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1303] Demolition activities, which generate construction debris, are expected to conclude in 2024 at Candlestick Point and in 2021 at HPS Phase II, a minimum of five years before the landfill is expected to close. Further, the City requires the diversion of

[1302] E-mail communication with David Assman, City of San Francisco, Department of the Environment, October 19, 2009.
[1303] CIWMB, 2009.

at least 75 percent of construction waste, as also required by MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Shared Stadium Variant on solid waste would be further reduced. The impact of the construction waste generated by the Shared Stadium Variant on the capacity of the Altamont Landfill would be less than significant.

Typical municipal solid waste has a landfill density of 739 pounds per cubic yard.[1304] Using this density factor, 45.7 million cubic yards of remaining capacity at the Altamont Landfill would be equivalent to 33.7 million tons of remaining capacity. The contribution of 72,592 tons from the 49ers/Raiders Shared Stadium Variant development would represent only 0.02 percent of the remaining capacity of the Altamont Landfill. Additionally, approximately 72 percent of the City's total waste stream, by volume, was diverted in 2008.[1305] Of the wastes that were not diverted, the City estimates that up to 65 percent of the total volume consists of readily recyclable or compostable materials, such as paper and food scraps.[1306] The remainder of the wastes consists of materials such as disposed household items and furniture, hazardous wastes, and construction wastes. The City has prepared a number of strategies to divert additional solid waste and achieve citywide diversion goals. These strategies would be utilized to achieve the City's overall waste reductions goals. The City's contribution to landfills is anticipated to diminish over time as the City implements more aggressive waste diversion strategies. Increasing solid waste diversions would extend the life of the landfills utilized by the City, lengthening the time horizon before the remaining disposal capacity is filled.

Similar to the Project, all residents and businesses of the 49ers/Raiders Shared Stadium Variant development would be expected to comply with the City's waste and recycling ordinances. As there would be several landfills with sufficient capacity to accommodate the solid waste generated by the 49ers/Raiders Shared Stadium Variant, along with the City's past waste diversion rate of 72 percent in 2008, implementation of the comprehensive waste diversion strategies, and implementation of mitigation measure MM UT-7a (Solid Waste Management Plan), the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact to solid waste generation, although impacts would be slightly greater than those of the Project.

Electricity, Natural Gas, and Telecommunications

The proposed improvements within the Project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. The power supplier may service the project via new extensions of the 12 KV distribution and or 115 KV transmission lines into HPS Phase II. This could include a new substation within the Project site. Impacts of construction activities associated with the Project, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with the 49ers/Raiders Shared Stadium Variant,

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[1304] http://wasteage.com/mag/waste_municipal_solid_waste/. Accessed September 29, 2009.
[1305] This figure is a preliminary estimate and represents the most recent data available. California Integrated Waste Management Board, 2008. *Jurisdiction Profile for City of San Francisco.* Available at <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID= 438&JUR=San+Francisco>, Accessed: November 5, 2008.
[1306] San Francisco, *Waste Characterization Study: Final Report.* 2008.

similar to the Project. Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be anticipated to provide extensions of existing infrastructure to the Project site as required. Such extensions would require minimal trenching, if any, and would not be anticipated to result in significant environmental impacts beyond those previously analyzed in this EIR. The subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how they would meet the infrastructure needs of the Project. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of the Project such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for the 49ers/Raiders Shared Stadium Variant, similar to the Project.

Energy

Construction

Similar to the Project, construction of the 49ers/Raiders Shared Stadium Variant is not expected to result in a substantial increase in the demand for natural gas. The BAAQMD and the CARB offer incentives for the replacement of diesel construction equipment with lower-emitting engines, which may include natural gas. However, such engines are not standard and would not be required for Project or Variant construction.

Similar to the Project, the construction activities proposed with the 49ers/Raiders Shared Stadium Variant do not include unusual or atypical activities that would result in a higher than average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy. Thus, given the type of development proposed, the energy demand created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. During the construction period, the Project Applicant would be required to use the BAAQMD's Construction Best Management Practices. The Best Management Practices limit equipment idling time to 5 minutes (also required by CCR Title 13, Section 2485), which helps to minimize wasteful fuel consumption. Additional standards pertaining to construction fuel efficiency have not been developed by the City, the CEC, or any other regulatory agency. Given these considerations, the construction-related energy use associated with the 49ers/Raiders Shared Stadium Variant would not be large or wasteful and is considered less than significant, similar to the Project.

Operation

Electricity

The criterion for this impact considers whether the 49ers/Raiders Shared Stadium Variant would result in a large increase in electricity consumption. The 49ers/Raiders Shared Stadium Variant would use nearly double the amount of electricity for stadium use, when compared to the Project, due to an increase from 12 games to 20 games per year. This would increase the 49ers/Raiders Shared Stadium Variant consumption to 8,160 from 4,080 MWh/year. This would result in an overall increase in total 49ers/Raiders Shared Stadium Variant consumption to 39,054 MWh/year from 34,974 MWh/year resulting from the Project. This represents an 11 percent annual increase. Taking the 49ers/Raiders Shared Stadium Variant's compliance with the Green Building Ordinance and its voluntary implementation of energy-saving design features into consideration, as

well as the level of development proposed, the electricity increase associated with the 49ers/Raiders Shared Stadium Variant would not be considered large.

The City's threshold also considers whether the 49ers/Raiders Shared Stadium Variant's energy consumption would be wasteful. The efficiency measures proposed under the 49ers/Raiders Shared Stadium Variant would result in building envelope consumption of at least 15 percent less electricity than a project that would not implement such measures. Further electricity savings would be anticipated as a result of the 49ers/Raiders Shared Stadium Variant's compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and the 49ers/Raiders Shared Stadium Variant's voluntary implementation of LEED® ND standards. However, because the 49ers/Raiders Shared Stadium Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the 49ers/Raiders Shared Stadium Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts to less than significant.

Natural Gas

The 49ers/Raiders Shared Stadium Variant would use nearly double the amount of natural gas for stadium use, when compared to the Project, due to an increase from 12 games to 20 games per year. This would increase the 49ers/Raiders Shared Stadium Variant consumption to 14,400 from 7,200 MBtu per year. This would result in an overall increase in total 49ers/Raiders Shared Stadium Variant consumption to 70,463 MBtu per year from 63,263 MBtu per year resulting from the Project. The 49ers/Raiders Shared Stadium Variant would result in an 11 percent increase over the natural gas amount that would be consumed by the Project. This is due to the increase from 12 yearly NFL events to 20 yearly NFL events with this Variant. The natural gas use at the Project site would represent less than 1 percent of the City's overall natural gas consumption of 28,918,000 million Btus, and overall natural gas demand would be over four times higher than under existing conditions, largely attributable to R&D uses at HPS Phase II. Natural gas use would be roughly five times higher at HPS Phase II than at Candlestick Point due to peak daytime demand from R&D uses. However, on a per-square-foot basis, the R&D Variant would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

However, because the R&D Variant Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the R&D Variant Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts to less than significant.

Petroleum Consumption

The 49ers/Raiders Shared Stadium Variant would increase trips to and from the Project site, increasing the use of petroleum fuels. Based on average fuel efficiencies for the City of San Francisco and the Project VMT (reported in the *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*), the 49ers/Raiders Shared Stadium Variant would result in a demand for 14.01 million gallons of gasoline and 0.93 million gallons of diesel annually. The use of fuels resulting from Similar to the Project, Project-related travel to and from the Project site with development of this Variant would be five times as high as existing conditions, a large increase in consumption. Similar to the Project, the 49ers/Raiders Shared Stadium Variant would increase trips to and from the site, increasing the use of petroleum fuels. However, this consumption would not be wasteful because (1) the 49ers/Raiders Shared Stadium Variant proposes to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) the 49ers/Raiders Shared Stadium Variant would include a transportation demand management (TDM) program designed to reduce the remaining vehicle trips; and (3) the 49ers/Raiders Shared Stadium Variant would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. Therefore, the 49ers/Raiders Shared Stadium Variant would result in a less-than-significant impact due to the wasteful use of transportation-related fuels, similar to the Project.

Greenhouse Gas Emissions

The 49ers/Raiders Shared Stadium Variant would have similar GHG emissions as the Project for both construction and operational emissions with the implementation of the mitigation measures. GHG emissions for this Variant were not explicitly calculated since the only increase would be in a few more game days (20 instead of 12) and associated mobile emissions which would make a small increase to the total annual GHG emission inventory. Therefore, since the majority of the GHG emissions for the 49ers/Raiders Shared Stadium Variant would remain the same, based on the less-than-significant conclusion for the Project, the 49ers/Raiders Shared Stadium Variant would also be less than significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2nd. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the 49ers/Raiders Shared Stadium Variant and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change. The 49ers/Raiders Shared Stadium Variant would not measurably change the parameters of the Project land use program, and thus this analysis applies to the 49ers/Raiders Shared Stadium Variant.

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CHAPTER V Other CEQA Considerations

V.A INTRODUCTION

Section 15126 of the *California Environmental Quality Act* (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the Environmental Impact Report (EIR) must also identify (1) significant environmental effects of the proposed project; (2) significant environmental effects that cannot be avoided if the proposed project is implemented; (3) significant irreversible environmental changes that would result from implementation of the proposed project; (4) effects found not to be significant; (5) growth-inducing impacts of the proposed project; and (6) secondary land use effects, including urban decay.

This Section is based upon information from documents[1307] including, but not limited to, the California Department of Recreation *Candlestick Point State Recreation Area General Plan*, Association of Bay Area Governments (ABAG) *San Francisco Bay Trail Plan*, San Francisco Bay Conservation and Development Commission *San Francisco Bay Plan*, San Francisco Bay Conservation and Development Commission *Bay Area Seaport Plan*, San Francisco Bay Conservation and Development Commission *Bay Area Water Trail Plan*, *City of San Francisco General Plan*, City of San Francisco *Bayview Hunters Point Redevelopment Plan*, City of San Francisco *Hunters Point Shipyard Redevelopment Plan*, the *City of San Francisco Planning Code*, and from physical observations of the Project site and vicinity from site visits conducted by PBS&J in 2008. Data for this Section were also taken from the *Candlestick Point–Hunters Point Shipyard Phase II Development Plan: Secondary Land Effects* by CBRE Consulting dated September 2009 and contained in Appendix U (CBRE Secondary Land Use Effects Study).

V.B SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROJECT

- Table ES-2 (Summary of Environmental Effects and Project Requirements/Mitigation Measures), which is contained in the Executive Summary chapter of this EIR, and Section III.A through Section III.S of this EIR provide a comprehensive identification of the Project's environmental effects, including the level of significance both before and after mitigation.

V.C SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

CEQA Guidelines Section 15126.2(b) requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. Development of the Project would result in the following significant and unavoidable project-related and/or cumulative impacts:

[1307] Copies of these documents are on file for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.

Transportation and Circulation

- Construction-related traffic impacts in the Project vicinity due to construction vehicle traffic and roadway construction especially over the long duration of expected construction activity
- Operation of the Project would result in an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system
- Operation of the Project would result in impacts at nine intersections where no feasible traffic mitigation measures have been identified
- Operation of the Project would result in AM peak hour traffic impacts at the intersection of Tunnel/Blanken and contribute to cumulative PM peak hour traffic impacts
- Operation of the Project would result in Project contributions at 12 study intersections that would operate at LOS E or LOS F under 2030 No Project conditions (cumulative impacts)
- Operation of the Project would result in Project contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Project conditions (cumulative impacts)
- Operation of the Project would result in Project contribution to cumulative traffic impacts at four freeway segments
- Operation of the Project would result in impacts at four freeway on-ramp locations
- Operation of the Project would result in Project contribution to significant cumulative traffic impacts at 12 freeway ramp locations
- Operation of the Project would result in impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp
- Operation of the Project would result in Project contribution to significant cumulative traffic impacts related to freeway diverge queue storage at five off-ramp locations
- Operation of the Project would result in increased congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno
- Operation of the Project would result in increased congestion and contribute to cumulative conditions at intersections along Palou Avenue, which would increase travel times and impact operations of the 23-Monterey, 24-Divisadero and the 44-O'Shaughnessy
- Operation of the Project would result in increased congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset
- Operation of the Project would result in increased congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street
- Operation of the Project would result in increased congestion at intersections in the study area, and make a considerable contribution to cumulative impacts which would increase travel times and impact operations of the 54-Felton
- Operation of the Project would result in increased congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts which would increase travel times and impact operations of the T-Third
- Operation of the Project would result in increased congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited

- Operation of the Project would result in increased congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express
- Operation of the Project would result in increased congestion on US-101 mainline and ramps, and on Bayshore Boulevard, which would increase travel times and impact operations of SamTrans bus lines on these facilities
- Proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street
- For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections
- Existing game day service and Project transit improvements would not be adequate to accommodate projected transit demand
- Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp
- Existing transit service and Project improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators
- Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Project conditions without an arena event
- Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations

Air Quality

- Operation of the Project would result in violations of BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out in the year 2029

Noise

- Construction would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before Project construction activity on adjacent parcels is complete
- Construction activities would result in a substantial temporary or periodic increase in ambient noise levels
- Increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes
- Noise during football games and concerts at the proposed stadium could result in temporary increases in ambient noise levels that would adversely affect surrounding residents for the duration of a game or concert

Cultural Resources

- Development of the Project could result in a substantial adverse change in the significance of a historical resource

V.D SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the Project. Specifically, Section 15126.2(c) states:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as a highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if any of the following would occur:

- The primary and secondary impacts would generally commit future generations to similar uses
- The Project would involve a large commitment of nonrenewable resources and the proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy)
- The Project results in irreversible damage from environmental accidents

Commitment to Similar Uses

Over the past three decades, various planning and development activities and associated environmental reviews have been undertaken for the Bayview Hunters Point neighborhood, including, most notably, Candlestick Point and HPS. All of these planning efforts have led to the Project's specific development program, which indicates a continued and long-term commitment of the Project site for the revitalization activities envisioned as part of the Project. The following discussion briefly outlines the planning history that has led to the Project, as proposed.

The existing General Plan land use map designates properties within the Project site as Candlestick Point Special Use District, Residential, Mixed Use, Parks and Open Space, and Public Facilities. These land use categories reflect Proposition F (1997), which amended the General Plan, *Planning Code*, and Zoning Map, and established the Candlestick Point Special Use District to accommodate the development of a stadium suitable for professional football and a shopping and entertainment center with open space and related parking facilities as principal uses, as well as other conditional uses, such as residential uses, subject to the approval of the Planning Commission.

Also in 1997, the Board of Supervisors, by Ordinance No. 285-97, adopted the HPS Redevelopment Plan for the revitalization of HPS.[1308] The HPS Redevelopment Plan contemplates development of a range of

[1308] San Francisco Redevelopment Agency, *Redevelopment Plan for the Hunters Point Shipyard Redevelopment Project*, July 14, 1997. A copy of this document is available for public review at the San Francisco Redevelopment Agency, One South

uses under the broad categories of industrial, research and development, mixed use, cultural and educational, residential, and open space. The HPS Redevelopment Plan divides the shipyard into five development parcels, Parcels A through E. Parcel F, which comprises approximately 440 acres of submerged land in the Bay was not proposed for development in the HPS Redevelopment Plan.[1309,1310]

The San Francisco Board of Supervisors adopted the *Bayview Hunters Point Redevelopment Plan* (BVHP Redevelopment Plan) in 2006. The BVHP Redevelopment Plan amends the *Hunters Point Redevelopment Plan*, established in 1969 and last amended in 1994. The primary redevelopment programs of the BVHP Redevelopment Plan include an Economic Development Program, Affordable Housing Program, and a Community Enhancements Program.

In late 2006, the San Francisco 49ers decided that the proposed stadium did not meet their needs. A site for a new stadium at HPS was identified. In May 2007, the Board of Supervisors and the Mayor endorsed a Conceptual Framework for the planning and development of the Project site, which includes Candlestick Point and HPS Phase II.

In June 2008, and in response to the Conceptual Framework, the San Francisco voters approved Proposition G, which is called the Bayview Jobs, Parks, and Housing Initiative. Proposition G encourages development of Candlestick Point and HPS with a mixed-use project, including park and open space improvements, approximately 10,000 homes for sale or rent, about 700,000 gsf of retail uses, about 2,150,000 gsf of "green" office, science and technology, research and development, and industrial uses, an arena, and a site for a new San Francisco 49ers stadium.

Implementation of the Project would require amendments to the BVHP Redevelopment Plan and the HPS Redevelopment Plan and Design for Development,[1311] as well as revisions to the General Plan, *Planning Code*, and zoning map to establish, in part, land use designations and allowable land uses, zoning, and design standards for future development.

The Project would include residential, office, retail, entertainment, and office uses, as well as community facilities, open space, and a new stadium and arena, to be developed adjacent to existing neighborhoods and within the existing Alice Griffith neighborhood, where new residential units would replace existing dwellings. Development of the Project would result in a continued commitment of the City of San Francisco to these uses, thereby precluding any other uses for the lifespan of the Project.

Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.

1309 In 1992, HPS was divided into six separate parcels, known as Parcels A, B, C, D, E, and F. These parcels correspond to the Navy's plan to phase remediation of hazardous materials on HPS on a parcel-by-parcel basis.

1310 In accordance with procedures for transfer of Navy property, the Agency accepted title to Parcel A in December 2004. In April 2005, the Agency transferred the portions of Parcel A-Prime to be privately developed to Lennar Urban to construct the infrastructure improvements required under the Phase I DDA. Subsequently, the transfer of Parcel B-Prime from the Navy to the Agency was delayed. As a result, on October 17, 2006, the Agency Commission approved an amendment to the Phase I DDA to remove Parcel B-Prime from the Phase 1 development and to shift the entitled residential units from Parcel B-Prime to Parcel A-Prime. The revised Design for Development standards for Parcel A address dwelling unit density standards, height and bulk limits, off-street loading, lot sizes, street design, and other similar topics.

1311 The 1997 HPS Redevelopment Plan establishes the land use standards for development in the Redevelopment Plan area. The 2004 Design for Development document outlines the design objectives, development standards, and urban design guidelines for projects developed in the Redevelopment Plan area.

Although the Project would commit the Project site to the proposed uses for future generations, it does not represent a change in commitment from the previously planned uses for the site, as described above. Further, the Project is essentially infill, replacing existing industrial, parking, and other underutilized uses with a Project that achieves a vision articulated by the City, the San Francisco Redevelopment Agency, and the community throughout a 30-year planning process. The Project would not represent a conversion of previously undeveloped open spaces to developed uses.

The Project was specifically designed to achieve the objectives stated under Proposition G and would be consistent with all of its population, employment, and housing policies. The Project would create economic opportunities for local businesses and residences by adding jobs, retail uses, and community services. The Applicant has committed to developing at least 3,345 units of the 10,500 units proposed with public housing (including rebuilding the Alice Griffith Public Housing complex at a one-to-one ratio), affordable housing, and below-market-rate housing. Units would range by size, type, and form consistent with the policies of Proposition G. Proposed development would occur at a level of density that would sustain local businesses and cultural amenities and would create a walkable environment. The Project would also fund infrastructure and transportation improvements needed to support such development. Therefore, while the Project would commit future generations to similar uses, the uses are consistent with and respectful of a thirty-year planning process.

Commitment of Nonrenewable Resources

Resources that would be permanently and continually consumed by Project implementation include energy (electricity and natural gas), water, and fossil fuels; however, the amount and rate of consumption of these resources would not result in significant environmental impacts related to the unnecessary, inefficient, or wasteful use of resources, as described below.

Energy

Energy use at the Project site would increase as a result of construction and operation of the Project. However, new buildings in California are required to conform to energy conservation standards specified in Title 24 of the *California Code of Regulations* (CCR). The standards establish "energy budgets" for different types of residential and nonresidential buildings and with which all new buildings must comply.

The Project Applicant has committed to including Project design features that would achieve 15 percent more energy efficiency than required by the 2008 Title 24 standards (refer to Section III.H [Air Quality], Section III.Q [Utilities], and Section III.R [Energy] for a discussion of energy-saving Project features). The Project would also comply with the City's Green Building Ordinance, as required by Chapter 13C of the *Environment Code*. The ordinance requires newly constructed commercial buildings over 5,000 gross square feet (gsf), residential buildings over 75 feet in height, and renovations on buildings over 25,000 gsf to obtain credits under LEED® or other green building standards.

The Project Applicant has committed to constructing all Project buildings to the LEED®ND Gold standard based on the Pilot Version of the rating system released in June 2007.[1312] Although energy savings associated with these programs could vary based on the credits chosen and, therefore, cannot be accurately

[1312] Since the initial release of this standard, the rating system has undergone two public comment periods, and several credit requirements have changed. The LEED® ND rating system is currently being finalized for formal release by the USGBC.

quantified, additional energy savings are anticipated. Pursuant to achieving the LEED® ND Gold standard, the Project would be required to implement measures that would directly or indirectly result in reduced energy consumption. Such measures include design features for high performance glazing, shading, envelope optimization, reflective roofs, and natural ventilation (reducing energy use for heating and cooling), natural and energy efficiency lighting (reducing energy for artificial lighting), reduced water consumption (reducing energy use associated with the conveyance of water and wastewater), and energy commissioning, a process that requires verification, monitoring, and regular maintenance of energy systems to achieve peak performance. Energy savings associated with this program could vary based on the credits chosen and associated energy-saving measures implemented. Therefore, the savings cannot be quantified at this time, although additional energy savings are anticipated.

Efficient energy use on the Project site would include energy-efficient building design strategies. Project buildings would be designed and sited to maximize solar gain and minimize heat-reflective surfaces, as well as provide landscaping to reduce heat reflection on adjacent structures. ENERGY STAR appliances would be installed by builders in the residential units, a measure aimed at reducing residential electricity consumption, which is a land use with high energy consumption rates. Refer to Section III.R for a discussion of energy.

In addition, the Project Sponsor would implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity; the use of solar thermal energy to provide space cooling with the use of absorption systems; and/or water for space heating and domestic water systems.

The Project would utilize water-conserving plants in the landscape plan, as well as drip irrigation in planter beds and the use of new or relocated mature trees (if feasible), which require less water than younger specimens. Shrub plantings and/or drought-tolerant groundcover would be utilized to minimize the use of large expanses of turf.

Compliance with all applicable building codes, as well as Project mitigation measures and other design features of the Project that are determined through the Design for Development process, would ensure that natural resources are conserved or recycled to the maximum extent feasible. It is also possible that new technologies or systems would emerge, or would become more cost-effective or user-friendly, that would further reduce the Project's reliance upon nonrenewable natural resources. Even with implementation of conservation measures, consumption of natural resources, including electricity and natural gas, would generally increase with implementation of the Project. However, the Project would not involve the wasteful, inefficient, or unjustifiable use of energy resources.

Water

In terms of potable water, implementation of the Project would generate a total of demand of approximately 1.68 million gallons per day (mgd) based on an estimate of historical benchmark demand, adjusted to account for current *California Building Code* and the requirements of the San Francisco Green Building Ordinance, which would require the installation of ultra-low flow fixtures, use of high-efficiency building equipment, efficient landscape irrigation techniques, and provision of water-efficient plant materials. As current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Project on water demand would be an increase of approximately 1.38 mgd.

While potable water use would increase, the Project would be subject to various water-conservation measures that are being implemented by the San Francisco Public Utilities Commission (SFPUC). The SFPUC's demand management programs range from financial incentives for plumbing devices to improvements in the distribution efficiency of the system. The conservation programs implemented by the SFPUC are based on the California Urban Water Conservation Council's list of fourteen Best Management Practices (BMP) identified by signatories of the Memorandum of Understanding Regarding Urban Water Conservation in California, executed in 1991.

In addition, the SFPUC is increasing its water-conservation programs in an effort to achieve new water savings by 2018. This program is based on the 2004 San Francisco Retail Water Demands and Conservation Potential Report[1313] (Demand Report) that identified potential water savings and implementation costs associated with a number of water conservation measures. These new conservation programs include high-efficiency toilet replacement in low-income communities and water-efficient irrigation systems in municipal parks. With this expanded conservation program, the SFPUC anticipates reducing gross per household consumption (which includes both residents and non-residents) from 91.5 gallons per day (gpd) to 87.4 gpd by 2018, which would result in a conservation supply potential of approximately 4.0 mgd annually. Refer to Section III.Q for a discussion of water.

While the consumption of water would increase as the result of construction and operation of the Project, the Project would voluntarily and/or by directive be subject to water-conservation measures that would serve to reduce water use. The Project would not involve the wasteful, inefficient, or unjustifiable use of water resources.

Fossil Fuels

Construction and operational activities related to the Project would also result in the irretrievable commitment of fossil fuels for automobiles and construction equipment. The use of fuels resulting from Project-related travel to and from the Project site would be considerably higher than under existing conditions, and the construction schedule of the Project would be lengthy (approximately 20 years), which would result in a large increase in consumption of fossil fuels. However, this consumption would not be wasteful because (1) the Project proposes to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) the Project would include a transportation demand management (TDM) program designed to reduce the remaining vehicle trips; and (3) the Project would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths.

The Project would be an infill project within a developed urban area that would provide access to employment, retail, and recreational opportunities. The VMT for the Project anticipates shorter and fewer trips as a result of the proposed density and mixed uses at the Project site.

As a result of these Project features and programs, between 28 and 34 percent of the weekday AM and PM peak hour person trips would be internal pedestrian trips within the Project site, according to the Transportation Study (Appendix D).[1314] Of the remaining external trips, 21 percent would be conducted

[1313] Hannaford and HydroConsult, *City and County of San Francisco Retail Water Demands and Conservation Potential*, 2004.
[1314] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*, 2009.

via transit and 3 percent would be conducted via bicycle.[1315] The shift to non-vehicular modes of travel would result in savings in transportation fuels. Over time, implementation of the State Alternatives Fuels Plan (see Regulatory Framework) is expected to increase the efficiency of vehicle trips, result in the development of alternative fuels, and shift trips to non-vehicular modes of travel. Project programs, in combination with local and State policies, would minimize vehicular fuel use.

The programs proposed under the Project for minimization of trips, as well as the Project's density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. Therefore, the Project would not be wasteful with respect to petroleum fuel consumption.

V.E EFFECTS NOT FOUND TO BE SIGNIFICANT

All impacts associated with agricultural resources and mineral resources have been determined to be "Effects Not Found to Be Significant" according to Section 15128 of the CEQA Guidelines, and are not addressed in this EIR for the reasons described below.

Agricultural Resources

The Project Site is located in the City of San Francisco, an urban area, and therefore not agricultural in nature. The California Department of Conservation designates no land within the City boundaries as Williamson Act properties or important farmland.[1316] The proposed Project would not convert farmland to a non-agricultural use, would not conflict with agricultural zoning or Williamson Act contracts, or cause other changes that would lead to the conversion of Farmlands of Statewide Importance to nonagricultural use. Accordingly, because no agricultural resources are located on or near the Project site, no impacts would occur. Therefore, no further analysis of this issue is required in the EIR.

Mineral Resources

All land in San Francisco, including the Project Site, is designated Mineral Resource Zone 4 (MRZ-4) by the California Division of Mines and Geology (CDMG) under the Surface Mining and Reclamation Act of 1975 (CDMG, Open File Report 96-03 and Special Report 146 Parts I and II). This designation indicates that there is inadequate information available for assignment to any other MRZ and thus the site is not a designated area of significant mineral deposits. Since most of the Project site is already developed, future evaluation or designation of the site would not affect or be affected by the proposed Project. There are no operational mineral resource recovery sites in the project area whose operations or accessibility would be affected by the construction or operation of the proposed Project. No effects to mineral resources of value to the region or the State would occur, and no further analysis of this issue area is required in the EIR.

[1315] CHS Consulting Group, Fehr and Peers, and LCW Consulting, *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study*, 2009.

[1316] San Francisco is identified as "Urban and Built Up Land" on the California Department of Conservation *Important Farmland of California Map,* 2002. This map is available for viewing on-line at the Department of Conservation website (http://www.consrv.ca.gov/DLRP/fmmp/images/fmmp2004_11_17.pdf), accessed for this report February 15, 2007.

V.F IRREVERSIBLE DAMAGE

For this Project, irreversible damage resulting from environmental accidents is limited to the potential for the risk of upset associated with the use, transport, or storage of hazardous materials during construction or operational activities, or associated with any potential remediation activities as part of the shoreline improvements. Section III.K of this EIR fully discloses and evaluates all potential impacts associated with the use, transport, or storage of hazardous materials during construction or operational activities involving hazardous materials, or associated with any potential remediation activities as part of the shoreline improvements. Compliance with federal, state, and local regulations pertaining to hazardous materials, as outlined in mitigation measures contained in Section III.K, would ensure this impact would be less than significant. Therefore, there would be no significant irreversible effects that would occur as a result of construction or operational activities involving hazardous materials or associated with potential remediation activities as part of the shoreline improvements.

V.G DIRECT OR INDIRECT ECONOMIC OR POPULATION GROWTH

As required by the CEQA Guidelines, an EIR must include a discussion of the ways in which the Project could directly or indirectly foster economic or population growth or the construction of additional housing and how that growth would, in turn, affect the surrounding physical environment (CEQA Guidelines Section 15126.2(d)).

Growth can be induced in a number of ways, including the elimination of obstacles to growth or through the stimulation of economic activity within the region. The discussion of removal of obstacles to growth relates directly to the removal of infrastructure limitations or regulatory constraints that could result in growth unforeseen at the time of Project approval.

In general, a project may foster spatial, economic, or population growth in a geographic area if it meets any one of the criteria identified below:

- The project establishes a precedent-setting action (e.g., a change in zoning or general plan amendment approval)
- The project results in the urbanization of land in a remote location (leapfrog development)
- The project removes an impediment to growth (e.g., the establishment of an essential public service, or the provision of new access to an area)
- Economic expansion or growth occurs in an area in response to the project (e.g., changes in revenue base, employment expansion, etc.)

If a project meets any one of these criteria, it may be considered growth inducing. Generally, growth-inducing projects: (1) are located in isolated, undeveloped, or underdeveloped areas, necessitating the extension of major infrastructure, such as sewer and water facilities or roadways; or (2) encourage premature or unplanned growth.

Precedent-Setting Action

The Project site is part of the larger Bayview Hunters Point neighborhood, an area characterized by well-established residential neighborhoods, commercial uses, and industrial areas. The *Bayview Hunters Point Area Plan* (BVHP Area Plan) is an adopted component of the *San Francisco General Plan* that serves as a guide to the future development of the BVHP community.[1317] This plan, based on many years of continued citizen input, seeks to provide guidelines for realizing the area's growth potential in a manner that is in the best interest of the local residents and the City as a whole.

The existing General Plan land use map designates properties within the Project site as Candlestick Point Special Use District, Residential, Mixed Use, Parks and Open Space, and Public Facilities. These land use categories reflect Proposition F (1997), which amended the General Plan, *Planning Code*, and Zoning Map, and established the Candlestick Point Special Use District to accommodate the development of a stadium suitable for professional football and a shopping and entertainment center with open space and related parking facilities as principal uses, as well as other conditional uses, such as residential uses, subject to the approval of the Planning Commission. For land use designations within the Hunters Point Shipyard, the BVHP Area Plan, General Plan, and zoning code defer to the Hunters Point Shipyard Redevelopment Plan.

The Project as proposed includes a General Plan amendment to establish a land use designation and specify the land uses that are allowable within this new designation consistent with the approved land use and development plan specified in Proposition G and corresponding amendment to the BVHP Area Plan. The General Plan Amendment and amendment to the BVHP Area Plan would not set a precedent by allowing uses that are not found elsewhere within the City or even the area. The proposed designation would be consistent with the nature of on-site and surrounding development. Implementation of the amendments would allow for continued use of existing development, while also permitting mixed uses. Therefore, the Project would not be growth inducing as a result of establishing a precedent-setting action.

Leapfrog Development

As infrastructure, public services, roads, and other services and communities amenities are expanded, there would also be a potential for development at the Project site to generate indirect population growth. Indirect growth is often defined as "leapfrog" development, development that occurs as infrastructure is expanded to previously un-served areas. Such development patterns usually occur in suburban areas adjacent to undeveloped lands. Areas surrounding the Project site are built out, except for sites such as Executive Park or India Basin that are currently undergoing redevelopment or are the subject of planned future development. Thus, the surrounding lands are not vulnerable to leapfrog-type development.

Removal of an Impediment to Growth

The Project is located in an urbanized area that is served by an existing network of electricity, water, sewer, storm drain, communications, roadways, and other infrastructure sized to accommodate or allow existing

[1317] San Francisco Planning Department, *San Francisco General Plan*, *Bayview Hunters Point Area Plan*, March 2006. The Area Plan, formerly named the *South Bayshore Area Plan*, was adopted in February 1970 (Board of Supervisors Resolution No. 6486). Subsequently, the Area Plan was updated in July 1995 (Resolution No.13917). The current 2006 Area Plan was renamed the *Bayview Hunters Point Area Plan* at the community's request to reflect its historic name for itself.

and planned growth. Infrastructure and services would be expanded to serve the Project, but it would not encourage additional local growth beyond that already planned under Proposition G (for the Project site) and under the redevelopment plans. The Project would replace aging and deteriorated infrastructure on the Project site, as well as infrastructure on HPS Phase II that is no longer in use. New on-site infrastructure would be constructed, some of which would connect to the existing off-site Combined Sewer System infrastructure, and some of which would be a new, separate system for on-site stormwater treatment. The Project would not expand infrastructure to geographic areas that were not previously served. The Project would create a new street grid that would improve access to the shoreline and connect the Project with existing neighborhoods. However, the Project would not create new transportation access to an area that was previously inaccessible, as the Project site is currently accessible. The infrastructure needed to support the level of growth anticipated under the Project was planned based on population projections that included the housing and employment associated with the Project. The infrastructure would not encourage new development (other than the Project), as the new on-site infrastructure would connect to an existing City system. The existing lack of adequate infrastructure on the Project site has not acted as an impediment to growth, as the Project site is immediately adjacent to off-site City infrastructure and new development could easily establish connections with that system.

Economic Expansion or Growth in Response to the Project

While the Project itself represents growth, the provision of new housing and employment opportunities would not indirectly encourage substantial new growth in the City that has not previously been projected. It would provide much-needed housing within the City to accommodate an extensive workforce from throughout the Bay Area. It would provide substantial employment opportunities in an area that historically has had few employment opportunities, and the new employees would be anticipated to be drawn from the Bay Area workforce, including the local workforce.

The Bay Area is a major employment center, with over 3.2 million jobs reported in 2005.[1318] A large percentage of this employment is in San Francisco. As shown in Table III.C-3 (Existing Employment [2005]) of Section III.C (Population, Housing, and Employment), there were approximately 553,090 jobs in the City in 2005, approximately 17 percent of the total regional employment. At the time of the 2000 Census, about 55 percent of the workers holding jobs in San Francisco lived in the City, while the remaining 45 percent lived in other jurisdictions.[1319] For this reason, the daytime population associated with local employment substantially exceeds the residential (nighttime) population. Estimated City employment for 2030 would be approximately 748,100 jobs.[1320]

As discussed in this EIR in Chapter I (Introduction) and Chapter II (Project Description), Proposition G encourages development of Candlestick Point and HPS with a mixed-use project that was defined in the Proposition as including park and open space improvements, approximately 10,000 homes for sale or rent, about 700,000 gsf of retail uses, about 2,150,000 gsf of "green" office, science and technology, research and

[1318] Association of Bay Area Governments, *Projections 2007,* 2006.
[1319] US Department of Transportation, *Census 2000 Transportation Planning Package*, 2006. It should be noted that a certain percentage of San Francisco residents also commute to other communities.
[1320] Memorandum from John Rahaim, Director of Planning, San Francisco Planning Department to Michael Carlin, Deputy General Manager, San Francisco Public Utilities Commissions, *Projections of Growth by 2030*, July 9, 2009. This number includes employment projections associated with the Project.

development, a ferry terminal and marina, an arena/performance venue, an arts center, and a site for a new San Francisco 49ers stadium. Proposition G states that the proposed development should, among other objectives, create a range of job and economic development opportunities for local, economically disadvantaged individuals and business enterprises, particularly for residents and businesses located in the BVHP area, and create substantial jobs and commercial opportunities for existing Bayview residents and businesses. The Project would fulfill all of the objectives of Proposition G and would be consistent with its policies.

Development of the Project would transform a currently underutilized and blighted area of the City into a vibrant mixed-use development with substantial housing and job opportunities. The new households would create a corresponding demand for goods and services, which are expected to be accommodated by the Project's non-residential uses. Because the Project provides a balance of housing and commercial uses and would accommodate new residents' needs for such goods and services, the increase in City population would not be expected to induce substantial commercial growth elsewhere in the City. Similarly, the proposed housing could accommodate the increase in employment on site. The combination of land uses in the Project would function to increase retail and commercial sales and activities within the City, as well as enhance the economic viability of the Project area. The creation of new commercial activities and housing would contribute to the economic vitality of the City, which would enable the continued provision of high-quality services and programs for residents and businesses and would contribute to a larger municipal revenue stream. The revitalization of the Project site and the increased connectivity and public access to shoreline amenities at Candlestick Point and Hunters Point could encourage already planned growth in the adjacent neighborhoods, such as at India Basin.

Construction employees would be required to construct the Project. The number of construction employees would vary depending upon the phase of construction, but would range from 30 employees at the end of construction activities to a maximum of about 455 employees during the most labor-intensive phase of construction. Current Agency policies regarding contracting and employment seek to maximize local hiring for construction. It is anticipated that out-of-area construction employees would commute from elsewhere in the region, rather than relocate to the San Francisco area for a temporary construction assignment. In addition, due to the nature of construction activities, the employment opportunities resulting from construction-related work assignments are not considered permanent. Construction-related activities would, therefore, have a negligible impact on population and housing resources.

Development at the Project site would provide 10,730 permanent jobs by 2030. Regional employment in 2005 consisted of 3.2 million jobs, with a projected increase of approximately 1.7 million jobs to 4.9 million jobs in 2030. San Francisco has traditionally experienced, and would continue to experience, ample employment opportunities that are not met by an equal supply of housing within the City, or even the Bay Area. The Project's contribution of 10,730 permanent jobs would represent 0.6 percent of the anticipated increase in regional employment through 2030 and is within the employment growth forecasts for both the City and the County.

The Project would provide increased tax revenues to the City. The positive revenue stream may result in the creation of indirect and induced jobs. Indirect jobs are those that would be created when the future owners and/or managers of the retail-commercial uses purchase goods and services from businesses in the region, and induced jobs are those that are created when wage incomes of those employed in direct and indirect jobs are spent on the purchase of goods and services in the region. The City's economic impacts

are primarily the result of purchases of goods and services, as well as payment of taxes and salaries, which affects the regional economy of the City and County, and, on a more indirect basis, California. Therefore, the positive revenue stream and the resulting increased economic viability of the Project site could result in indirect growth-inducing impacts.

However, the Project would implement a number of smart-growth principles, including:

- Mixed uses that promote living and working in the same area to limit vehicle miles traveled
- Uses oriented around existing and proposed transit to discourage use of the personal vehicle
- Transit connectivity so other City residents can take advantage of the opportunities offered by the Project
- Pedestrian and bicycle pathways to encourage these alternative methods of transportation
- Bicycle racks and pedestrian seating in prominent locations to encourage walking and cycling activities
- A mix of recreational uses to provide for the recreational needs of the community

Implementation of these features would limit indirect growth-inducing impacts by providing all necessary services within one development. Provision of most, if not all, needed services and amenities within the Project would reduce the need to develop such uses elsewhere in the City.

V.H URBAN DECAY

Secondary land use effects can also include economic and social changes. Economic and social changes are not in themselves significant impacts on the environment; however, a physical change in the environment caused by economic and social factors attributable to a development could sometimes result in a reasonably foreseeable indirect environmental impact, such as urban decay or deterioration. Urban decay results from land use decisions that cause a chain reaction of store closures and long-term commercial vacancies, ultimately destroying existing neighborhoods and leaving decaying shells in their wake.[1321] Urban decay can be defined as, among other characteristics, multiple visible symptoms of physical deterioration that invite vandalism, loitering, and graffiti that is caused by a downward spiral of business closures and long-term vacancies. The physical deterioration to properties or structures is so prevalent, substantial, and lasting for a significant period of time that it impairs the proper utilization of the properties and structures, and the health, safety, and welfare of the surrounding community. The manifestations of urban decay include such visible conditions as plywood-boarded doors and windows, parked trucks and long-term unauthorized use of the properties and parking lots, extensive tagging, graffiti, and offensive words painted on buildings, dumping of refuse on site, overturned dumpsters, broken parking barriers, broken glass littering the site, dead trees and shrubbery along with weeds, lack of building maintenance, homeless encampments, and unsightly and dilapidated fencing.[1322]

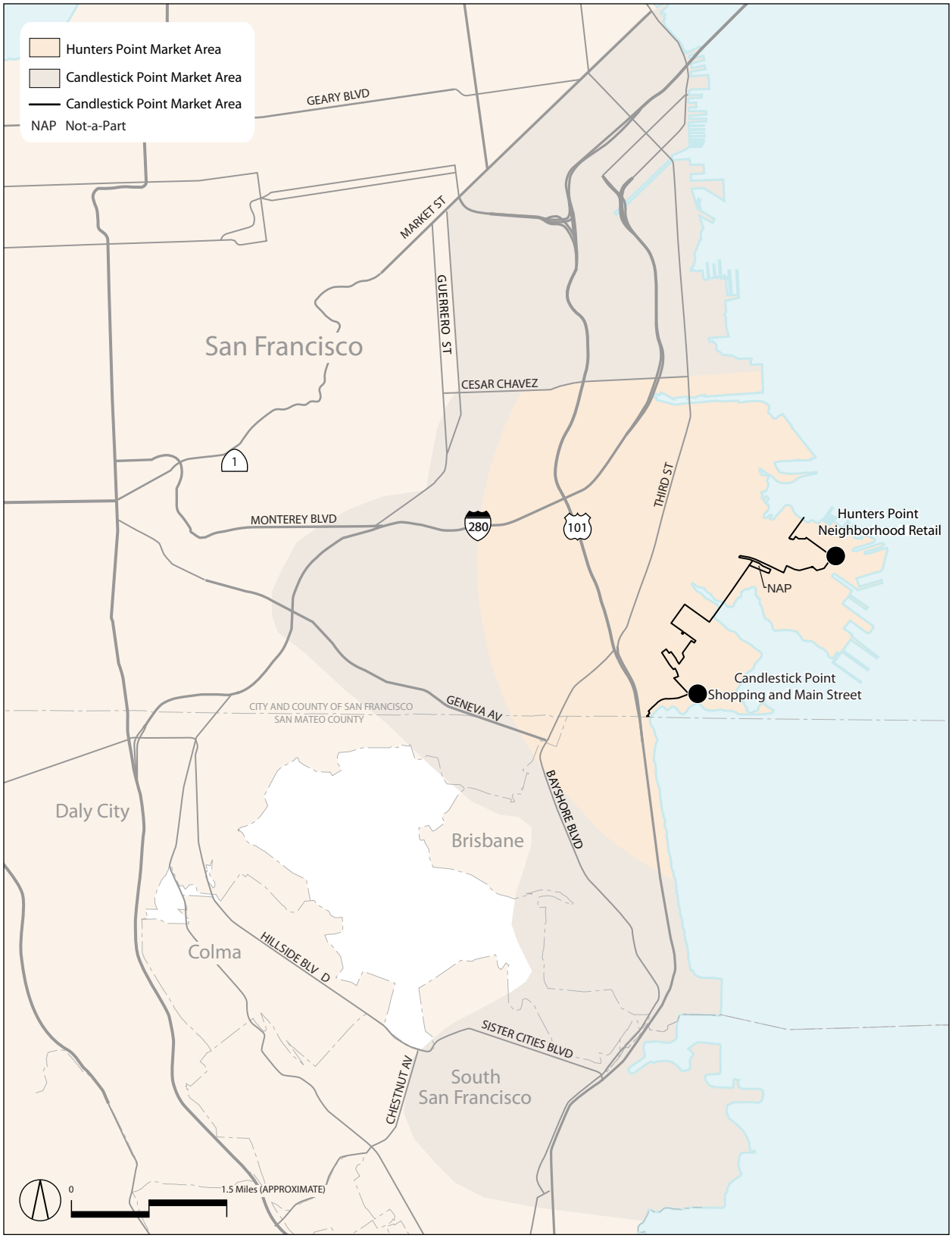
In order to analyze whether the Project could result in a significant indirect environmental impact of urban decay or deterioration in an identified market region, an analysis of potential secondary land use effects

[1321] *Bakersfield Citizens for Local Control v. City of Bakersfield, et al.*, 124 Cal. App. 4th 1184; 22. Cal. Rptr. 3d 203; 2004 Cal. Daily Op. Service 10918; 2004 Daily Journal DAR 14768.
[1322] CBRE Consulting, September 2009.

was prepared by CBRE Consulting (Appendix U) to assess the existing retail commercial market in relation to the Project, including potential impacts on local retailers. The analysis focuses on determining if the Project and the identified cumulative projects would directly or indirectly cause any existing retailers to close, and, of so, whether the subsequent vacancies would remain vacant for a prolonged period of time such that they develop the symptoms described that contribute to and eventually lead to urban decay. CBRE Consulting's analysis of the local retail market was based on a range of research and background resources. First, the firm has completed numerous real estate research projects in the San Francisco Bay Area and is generally familiar with the characteristics of the geographic areas covered in this study. Second, CBRE Consulting conducted field research of the major regional and neighborhood shopping nodes in southeastern San Francisco and nearby cities in May 2009 to gain a better understanding of current market conditions including shopper volumes, the level of retail vacancy, and the general condition of local retail properties. Various commercial databases, including Claritas and CoStar, informed this fieldwork by providing background on the larger shopping centers and retail businesses in the area. Moreover, taxable retail sales data from the California Board of Equalization (BOE) and information on sales tax collections from the City of San Francisco complemented the field research by providing a view of the relative performance of retail categories within specific geographic areas. Third, CBRE Consulting contacted local economic development and planning officials to understand their views on shopping patterns and the strengths and weaknesses of individual retail areas. Several prior research studies, including a January 2008 report prepared by Irwin Development Group for the Project and a Seifel Consulting May 2009 Draft report prepared for the San Francisco Redevelopment Agency on the Bayview Hunters Point Redevelopment Area offered additional background for this analysis.[1323]

The CBRE Consulting retail analysis is the source of the analysis of potential Project impacts on urban decay. The CBRE Consulting study considers the primary trade areas, or retail market areas, for the retail components of the Project based on the location of the Project and other retail commercial areas and shopping centers and the population and income characteristics of the area (Figure V-1 [Retail and Commercial Market Areas]). Industry sources such as ICSC and ULI were first consulted to determine what factors are most indicative of trade area boundaries for regional shopping centers. ICSC defines the typical market area for regional shopping centers as being within a 5- to 15-mile radius. San Francisco has a relatively small geography with a dense urban population. Because of this and the hilly topography of San Francisco, it was determined that a simple radius would be unrealistic and would not reflect the realities of how long it takes to drive from one point to another. Instead, the market area was determined primarily through drive-time analysis. In addition, although an estimated 12 percent of all retail trips to the Project are expected be generated by public transit or bicycling, the drive-time estimates are viewed as a reasonable approximation of the accessibility of the Project's retail areas. For purposes of this analysis, the Candlestick Point retail market area is roughly an area that is within a 15-minute drive of the planned regional center.[1324] The market area defined for the HPS Phase II component is for the most part a 3-mile radius. This boundary roughly corresponds with a 10-minute drive time.[1325]

[1323] See "Retail Market Analysis for Candlestick Point, San Francisco, California, January 2008," Irwin Development Group, and "Bayview Hunters Point Redevelopment Plan Amendment, Existing Conditions Report, May 2009 Administrative Draft," prepared for the San Francisco Redevelopment Agency by Seifel Consulting.
[1324] CBRE Consulting, September 2009.
[1325] CBRE Consulting, September 2009.



SOURCE: CB Richard Ellis, Inc, 2009.

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FIGURE V-1

Candlestick Point — Hunters Point Shipyard Phase II EIR

RETAIL AND COMMERCIAL MARKET AREAS

CBRE developed a statistical regression-based model to estimate retail spending potential for a market area based on household counts, income, and consumer spending patterns. The model determines the extent to which a designated market area is or is not capturing its sales potential based on reported taxable sales data. In California, these data are generally published by the Board of Equalization (BOE) or provided by municipal tax consultants. In order to estimate the impact of the planned retail centers to the existing retail sales base, CBRE first allocated the retail by component into the retail categories used by the BOE, which facilitates a direct comparison of the projected Project retail sales to the existing sales in the market areas.

Some space at each of the Project's retail areas is allocated to non-retail tenants, which include bank branches, business services (e.g., tax preparation, real estate offices), and personal services such as hair and nail salons and dentist offices. Since revenues for these types of tenants are not tracked by the BOE, the analysis uses broader retail demand growth (based on projected new households and BOE-based sales estimates) as a proxy for the likely demand for non-retail services. In other words, if future demand from new household growth is high enough such that substantial retail sales impacts are not anticipated, then the related demand from new households should also be sufficient to support services-oriented tenants in the Project's retail areas as well. The sales estimates are for retail tenants only, as defined by the BOE classifications.

For analytic purposes, CBRE developed an estimate of the existing sales base, starting with actual annual sales data from 2007. This base was then adjusted to a 2009 estimate, with further adjustments reflecting expectations regarding the characteristics of the existing base by 2030. Retail categories in which spending is not fully captured are called "leakage" categories, while categories in which more sales are captured than are generated by market area residents are called "attraction" categories. Generally, attraction categories signal particular strengths of a retail market, while leakage categories signal particular weaknesses. The CBRE report analyzes the retail sales leakage and attraction profile of the market areas, meaning the extent to which market area stores capture retail spending from market area households as well as from households located outside the market area. It provides a quantitative measure of the market area's sales performance. CBRE's approach to assessing the potential for urban decay is grounded in this analysis, focused on determine if the Project and identified cumulative projects would directly or indirectly cause any existing retailers to close, and if the subsequent vacancies would remain vacant for a prolonged period of time such that they develop the symptoms of urban decay described above.

- While the first new retail may open as early as 2019, full build-out is expected to be completed in 2027. It is assumed that if the retail planned for the Project would add sales to a retail category in an amount greater than the combination of estimated recaptured leakage in the category and the expected demand from new households, at worst the remaining amount of sales would be diverted away from existing market area retailers. This Section discusses potential sales impacts to existing stores that are located inside the defined market areas and outside but near the two respective market areas as a result of potential changes in shopping patterns that could occur after the opening of the Project's retail components. For further details of the assumptions of the market analysis, please refer to Appendix U and its Exhibits.

Baseline Data

The San Francisco retail base is substantial, and the extent to which it can absorb the Project's planned retail areas without over-saturating the market and contributing to potential store closures and urban decay

is dependent on many complex market factors. These factors include the size and strength of San Francisco's retail inventory, the characterization of San Francisco as a retail hub, the performance of key retail submarkets, the historic ability of the market to back-fill vacancies, and the demonstrated level of retailer interest in establishing new operations in San Francisco. As a regional center, San Francisco also draws large numbers of commuting employees from surrounding areas, who also contribute to the City's retail sales attraction. For example, the Metropolitan Transportation Commission, the transportation planning agency for the nine-county Bay Area, estimated that San Francisco's net in-commute (i.e., total employment less employed residents) was 171,544 employees in 2006 and projected that this figure would increase to 314,073 employees by 2035.[1326] This net inflow contributes to restaurant sales, purchases at downtown shopping areas, and stops at shopping centers along major traffic routes. In 2008, the San Francisco Convention & Visitor Bureau estimates that 16.4 million visitors to San Francisco spent $3.6 million on restaurants, general merchandise, apparel, gas/auto services, and miscellaneous retail.[1327] That comprises a large portion of San Francisco's previous year's total annual taxable sales of $10 billion. Total leasable space in San Francisco is approximately 3.8 million square feet.[1328] Total retail sales tax collected for 2007 was $117 million. The largest spending category is restaurants, comprising 21 percent of total retail sales tax, an unusually large share compared to the average of 13 percent of total taxable sales statewide.[1329]

San Francisco's sales are concentrated in the eating and drinking places category (i.e., restaurants) and among other retail establishments, which include office supplies, computer stores, jewelry, sporting goods, and miscellaneous retail. The sales share for apparel stores (10.3 percent of the total) is also high, especially when compared with the statewide average of 3.7 percent, whereas the shares for motor vehicles and parts, service stations, and building materials are relatively low.[1330] San Mateo County, by contrast, offers a much more representative mix of retail when compared with the rest of the state since there are more areas devoted to car dealers and "big box"-type stores. Within San Mateo County, the cities of Daly City and San Bruno host regional-serving retail primarily at Westlake Shopping Center, Serramonte Center, and the Shops at Tanforan, though these two cities still capture a relatively small share of overall purchases among the two counties.

CBRE Consulting also evaluated data provided by the City of San Francisco showing the annual sales tax collections by retail category for 2003-2008, which are prepared by MuniServices, a municipal tax consulting firm. The 2008 sales tax information presents a more current picture of retail activity in San Francisco and reinforces the findings about the mix of retail that were apparent in the BOE figures. Total retail sales tax collected for 2008 was $117.0 million, which reflects San Francisco's percentage share of overall sales tax collections. Another advantage of the MuniServices information is that it includes subsets of the data for several neighborhood retail districts within San Francisco, including South Bayshore, which substantially overlaps with the HPS Phase II market area and also accounts for a large Section of the

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[1326] See "Travel Forecasts Data Summary: Transportation 2035 Plan for the San Francisco Bay Area, December 2008," Metropolitan Transportation Commission; (http://www.mtc.ca.gov/maps_and_data/datamart/forecast/).
[1327] San Francisco Convention & Visitor Bureau, *Total Direct Visitor Spending within San Francisco: 2008*.
[1328] CBRE Consulting, September 2009.
[1329] CBRE Consulting, September 2009.
[1330] See *Taxable Sales In California (Sales & Use Tax) During 2007*, Table 1, California Board of Equalization website (http://www.boe.ca.gov/news/pdf/ts_a07.pdf).

Candlestick Point market area. Sales tax data for the Third Street corridor (a subdistrict within South Bayshore), San Bruno Avenue, and Leland Avenue serve as further indicators of the mix and level of the retail activity in the southeastern Section of San Francisco. Table 6 presents the sales tax collections for South Bayshore and the other relevant retail districts tracked within the MuniServices data. Since the Third Street corridor appears to be fully within the South Bayshore boundaries, these areas in total provide about 13 percent of the taxable retail purchases in the City.

The market area for the Candlestick Point regional center contains one primary retail district—South Bayshore—that could potentially be impacted by the opening of the Project's retail components. There are also three sub-district corridors in the Candlestick Point market area: Third Street, San Bruno Avenue, and Leland Avenue. The South Bayshore area accounts for the majority of taxable retail activity in these parts of San Francisco. In addition, unlike the City as a whole, the categories of building materials, service stations, and motor vehicles and parts are particularly strong, each comprising at least a third of San Francisco's overall taxable sales in these sectors. The South Bayshore district showed 2008 taxable retail sales totaling $1.3 billion. This corresponds to $13.5 million in sales tax revenue, which represents approximately 11.5 percent of San Francisco's total sales tax collected for 2008. The Third Street corridor, a subset of the South Bayshore retail district, is an emerging transit-oriented area following the introduction of a new light rail line along Third Street in 2007. The construction of the Third Street line included a mix of infrastructure improvements such as new sidewalks, lights, and benches. Comprising only 2.2 percent of total San Francisco retail sales tax, with taxable retail sales totaling $258.1 million and sales tax of $2.6 million, the largest taxable retail category in the Third Street corridor is building materials. Gas stations and restaurants are the next two biggest taxable categories. Taxable retail sales totaled $258.1 million and sales tax $2.6 million for this sub-district in 2008. San Bruno Avenue is a small retail district located just to the southwest of where Highway 101 crosses Interstate 280. The retail area is primarily an 8- to 10-block stretch of gas stations, shops, restaurants, and service-oriented businesses between Hale Street on the northern end and Paul Street to the south. A few of the intersecting streets are major thoroughfares that pass under elevated sections of the freeway, and there is a highway exit and on-ramp from San Bruno Avenue at Stillman Street. The retail properties in the area tend to be older and are in fair to moderate condition. The larger stores include Walgreens, a Kragen Auto Parts, and a few ethnic specialty food markets. Fast food chains and other convenience restaurants (pizza, taquerias, Asian take-out) are also common. While there were a few retail vacancies in the area, these were being marketed by landlords, and there were signs that older properties had been re-tenanted with new uses, (e.g., a former movie theatre that is now occupied by a church).The retail sales tax revenues in this corridor account for about 1.4 percent of total sales tax citywide. Gasoline stations contribute the highest share of the district's tax revenues, followed by restaurants, other retail, and motor vehicles and parts. This neighborhood also appears to have been served by a Cala Foods grocery store (1390 Silver Avenue) that has closed. CBRE Consulting visited this property during its field research in May 2009. At the time, the store was closed with a chain-link fence around the property, and no real estate brokerage signs were visible, which suggests that the property was not yet being marketed to new tenants.

Leland Avenue's retail district is the smallest of the four neighborhood shopping areas in the MuniServices data that CBRE Consulting analyzed, accounting for 0.1 percent of all retail sales tax collected in San Francisco. This shopping district, which is located within the Visitacion Valley neighborhood, has lower traffic volumes and a smaller mix of retail options than either the Third Street or the San Bruno Avenue

corridors. The four-block Section of Leland Avenue between Bayshore Boulevard and Cora Street has a Bank of America branch, a few small restaurants and produce stores, and some neighborhood services. This district also previously included a small grocery store, the Super Fair market, which was listed in a Claritas database of neighborhood businesses. However, during CBRE Consulting's field research in May 2009, this store building had been razed. Taxable retail sales totaled $13.2 million in 2008, with $131,733 collected in sales tax. Chart 5 below shows this district's sales tax by retail type in comparison to San Bruno Avenue. Sales tax in the Grocery category comprised about half of all retail sales tax in the Leland Avenue district, though it appears that there has also been a recent food store closure in the area.

As mentioned, the South Bayshore area, which is primarily south of Cesar Chavez Avenue and east of Highway 101 in San Francisco, comprises a large part of both the HPS Phase II and the Candlestick Point market areas. While the introduction of the Third Street light rail line has contributed to investment in this neighborhood, this Section of the city is largely within the Bayview Hunters Point Redevelopment Project Area. Specifically, Project Area B, as defined by the San Francisco Redevelopment Agency, encompasses most of the Third Street retail corridor.

Seifel Consulting prepared a recent mandated study of the Bayview Hunters Point Redevelopment Area for the San Francisco Redevelopment Agency. While the report highlighted several positive improvements in Project Area B including the planned development of a 15,000-square-foot Fresh & Easy grocery store and the potential opening of a Lowe's Home Improvement store, Seifel Consulting concluded that "Project Area B continues to suffer from unsafe and unhealthy buildings, inadequate circulation, lack of economic development, underutilized retail and commercial corridors, environmental impediments, problem businesses and a high crime rate."[1331] These conditions are indicative of economic and physical blight and are "substantial and prevalent"[1332] in Project Area B such that further redevelopment was recommended.

With regard to retail properties in particular, the Seifel report indicates that the two retail corridors in the area, Third Street and a Section of Bayshore Boulevard, have historically had higher vacancies than other areas of San Francisco due to the perception of crime in the area. One business, a Walgreens located on the corner of Third Street and Williams Avenue reportedly spends $15,000 per month on security measures and loses about $12,000 per month in merchandise theft. There are numerous mid-sized to large retail properties in Project Area B that have experienced long-term vacancies and have fallen into disrepair due to limited demand and existing rent levels that are reportedly too low to justify investments in building improvements. Specifically, the 50,000-square-foot former Goodman's Lumber store on Bayshore Boulevard has been vacant for almost a decade while the adjacent former Whole Earth Access store space has been closed for at least 13 years.[1333]

Further analysis by Seifel Consulting indicates that retail lease rates in the Project Area B are much lower than other neighborhood shopping districts in San Francisco due a range of factors:

> Bayview neighborhood commercial establishments struggle to attract desirable tenants due to the poor condition of buildings along Third Street, the high crime rate, and public improvement

[1331] "Bayview Hunters Point Redevelopment Plan Amendment, Existing Conditions Report, May 2009 Administrative Draft," prepared for the San Francisco Redevelopment Agency by Seifel Consulting, p. I-3.
[1332] Ibid., p. III-65.
[1333] Ibid., p. III-47; Note that redevelopment of the Goodman's Lumber store site has been planned for years and that Lowe's Home Improvement is currently evaluating the property as a new store location.

> deficiencies. Moreover, the ability to attract tenants is hampered by the lack of local brokers specializing in the area. Retail brokers tend to specialize in geographic areas with a concentration of retailers. The perception of the brokerage community is that the Bayview retail market is weak or non-existent for neighborhood serving retailers. The area will likely continue to struggle unless this perception is changed through redevelopment assistance.[1334]

The Seifel Consulting analysis of retail property conditions is consistent with CBRE Consulting's observations about the South Bayshore shopping districts. While there are some larger retailers such as Walgreens, Smart & Final, and a Foods Co. store, which had moderate shopper volumes, there are also sections of Third Street and Bayshore Boulevard with vacant store space that is not likely to be re-tenanted without substantial investment in improvements.

For the purpose of this analysis, CBRE Consulting calculated the retail sales base so that the magnitude of each component of the Project's impact on the market area could be measured against the existing base. While the analysis assumes the Project would not be fully operational until 2030, the sales base relevant to the analysis for CEQA purposes is the existing sales base, reflective of existing conditions. CBRE Consulting developed an estimate of the existing sales base, starting with actual annual sales data from 2007. This base was then adjusted to a 2009 estimate, with further adjustments reflecting expectations regarding the characteristics of the existing base by 2030. Sales base adjustment factors may include the opening of new shopping centers and stores, closure of retail stores that contributed to the 2007 sales base, changes in consumer preferences in retail spending, and residential growth in the area, which drives additional demand for retail goods. The Candlestick Point market area sales base is calculated to be $5.34 billion in 2007, but is adjusted to $5.30 billion in 2009. The HPS Phase II market area retail sales estimate was $554.1 million in 2007, adjusted to $534.8 million in 2009.[1335]

The Candlestick Point market area had a strong retail sales draw in 2007, to which sales were attracted in almost every retail category except Motor Vehicles and Parts. The market area can be characterized as fully meeting the retail needs of its residential population, as well as partially supporting the retail needs for households beyond the market area boundaries. These sales attraction and leakage findings (for the category stated) suggest that the market area is a retail destination supporting numerous shopping centers and retailers that draw from a consumer base far exceeding the market area's resident population.

Based on 2007 retail sales data, the HPS Phase II neighborhood retail market area had retail sales leakage, with 10.9 percent of residents' spending ($68.1 million) estimated to occur outside the geographic area. Despite overall retail sales leakage, food stores, home furnishings and appliances, and building materials had attraction. The defined market area for HPS Phase II had a net loss of retail sales, despite these three retail categories that attracted substantial retail sales from non-residents. Overall, the HPS Phase II market area can be characterized as not fully meeting the retail needs of its resident population. These sales attraction and leakage findings suggest that the market area is underserved by retail in most categories except for the three categories that experienced attraction.

[1334] Ibid., p. III-50.
[1335] CBRE Consulting, September 2009.

Candlestick Point Retail Sales Impacts

The Candlestick Point retail component would contain 635,000 sf of regional retail and an adjacent 125,000 sf of adjacent neighborhood retail and business services area. The regional center would be anchored by a 125,000 sf general merchandiser. Other anchors would be a 60,000 sf grocery store and a cinema. Large stores planned include those selling books, sporting goods, hardware, and electronics. Smaller stores would include 70,000 sf of apparel, a food court, sit-down restaurants, furniture and home furnishings, gifts, and specialty retail. A small portion of the space would be allocated to business and personal services stores such as banks, spas, and salons.

The CBRE Consulting report estimates that sales at the Candlestick Point regional center would total $190.6 million in 2009 dollars annually, with another $26.7 million at the adjacent neighborhood retail area. Sales at the Candlestick Point regional center would be concentrated in the "Other Retail Stores" category, which covers electronics/appliances, sporting goods, books, a cinema, and other specialty retailers, as well as the General Merchandise and Apparel Categories. The neighborhood retail planned adjacent to the regional center would include Restaurants, Other Retail Stores, a drug store, and some non-retail personal services and businesses.

CBRE Consulting calculated the assumed percentage of new demand within the market area that could be captured by the Candlestick Point regional center and neighborhood retail. These capture rates were developed based on comparing the share of the new development's projected sales to the total retail sales in the market area. As shown in Exhibit 34 of Appendix U, the 24,395 households added by 2030 are projected to generate $694 million in new retail demand spread across the BOE retail categories. The CBRE Consulting analysis determined that Candlestick Point market area retailers could reasonably expect to capture between 50 and 85 percent of the new household demand, depending on the retail category (refer to Exhibit 34 of Appendix U). Applying these capture rates, Candlestick Point market area retailers would capture up to $284.6 million in sales generated by the new market area residents. Further applying these capture rates for this portion of the Project, $11.0 million in new household demand is likely to be captured by the planned Candlestick Point regional center and neighborhood retail stores. This comprises approximately 4.0 percent of all available market area captured sales. Remaining demand would be available to offset sales diverted from existing retailers as a result of the Candlestick Point development achieving its projected level of sales. The $246.3 million in new household demand captured within the market area would be available to offset any potential impacts (Market Area Sales Captured minus Estimated Capture of Demand from New Households minus New Demand Captured by HPS Phase II Retail minus Other Demand Captured by Offsetting Impacts in HPS Phase II Market Area; refer to Exhibit 34 of Appendix U).

Another source of potential retail demand for new retail projects can be recaptured sales leakage from resident spending that is occurring outside the Candlestick Point market area. However, the Candlestick Point market area has retail sales leakage in only one category, Motor Vehicles and Parts. This category is not relevant to the analysis, since no motor vehicles and parts retailers are planned for the regional center or neighborhood retail area. Exhibit 35 of Appendix U shows that no potential leakage from the market area that would be available to absorb sales at the new retail planned for Candlestick Point.

New demand associated with household growth is estimated to account for $11.0 million of the Project's projected $173.2 million in market area sales (refer to Exhibit 35 of Appendix U). The remaining $246.3 million in demand from new households would be distributed among other market area stores, such that potential impacts to existing stores would be at least partially offset. Remaining impacts are estimated in the Apparel Stores and Other Retail Stores categories. However, as a share of the market area sales, these impacts are only 2.3 percent in Apparel and less than 1.0 percent in the Other Retail Stores category. There is also still a large amount of remaining demand in the General Merchandise, Food Stores, Restaurants, and Building Materials categories. If any Apparel retailers or Other Retail Stores were to close due to development at Candlestick Point, there appears to be sufficient demand for a store in a different retail category to re-tenant the space. Therefore, no substantial impacts to the detriment of existing retailers in the Candlestick Point market area, including retailers on Third Street, Leland Avenue, and San Bruno Avenue, are estimated to lead to prolonged vacancies as a result of the Candlestick portion of the Project.

CBRE Consulting also identified seven regionally oriented shopping centers in San Francisco, Daly City, San Bruno, and San Mateo, which are potentially competitive with the planned regional center at Candlestick Point. Six of these centers were analyzed through field research, and background on these properties is presented below. The seventh center, Hillsdale Shopping Center in San Mateo, was considered too distant to merit a field visit, though this shopping area was included in the analysis.

These seven centers range in size from 569,049 square feet to 1,250,000 square feet, with an average of about 850,000 square feet. Exhibits 39 through 41 of Appendix U map the locations of each of these shopping centers in comparison with the Candlestick Point regional market area. Estimated trade areas and trade area overlaps with the Candlestick Point market area are shown for three representative centers: Westfield San Francisco Centre, the Shops at Tanforan, and Westlake Shopping Center. CBRE Consulting calculated the number of households within each of the three regional shopping centers' respective trade areas and the degree of overlap with the Candlestick Point market area. Trade area estimates range from 167,447 to 303,645 households for each of the three centers. Estimating the potential diversion of the existing consumer base based on the assumption that up to one-half of the trade area households in the overlapping geographies may redirect their purchasing to the Candlestick Point retail stores, the representative centers and surrounding regional retail could experience potential sales impacts of as much as 16.1 percent of their 2009 retail base following the opening of the Candlestick Point retail area.

Projections show that long-term household growth would exceed the estimates of potential consumer sales base diversions for two of the three representative trade areas (Westfield and Tanforan). The trade area for the third representative regional center (Westlake) could experience a net loss of 1.1 percent of its 2009 estimated trade area household base despite household growth.[1336] Similar results are anticipated for the other regionally oriented shopping nodes. Consequently, local household growth from 2009 to 2030 in San Francisco and surrounding San Mateo County cities would likely be strong enough to generate sufficient new demand to offset most, if not all, potential sales impacts on competitive stores. Similarly, new household demand growth is anticipated to be ample enough to support the non-retail tenant space within the regional center and neighborhood retail component without creating substantial sales diversions from

[1336] This is based on a very conservative estimate that the planned Candlestick Point retail area would divert a full 50 percent of household demand from the overlapping trade area, and would be lower if a more moderate assumption of re-directed demand had been applied.

competitive businesses in the market area. If, however, a comparable business does close due to the opening of the new non-retail tenants at Candlestick Point, demand for other non-retail services or across retail categories is expected to be sufficient such that any vacant spaces can be re-tenanted.

San Francisco and northern San Mateo County offer a diverse set of retail options, which serve local residents, daily commuters, out-of-town business travelers, and tourists. Despite recent declines in local retail sales, most of the regional- and neighborhood-shopping areas that CBRE Consulting visited had limited vacancies due to store closures, and with the exception of the South Bayshore area, retail properties were typically well maintained. In addition, the San Francisco metro area is viewed as a vibrant market, where many national retailers are continuing to expand. Based on the findings regarding the presence of new retail demand sufficient to support the Candlestick Point regional and neighborhood retail components, other cumulative retail projects, and/or backfill retail spaces vacated as a result of Project impacts, the Candlestick Point regional and neighborhood retail components would not cause or contribute to urban decay. This conclusion pertains to the Candlestick Point retail components on both an individual and cumulative basis.

HPS Phase II Retail Sales Impacts

The HPS Phase II neighborhood retail would be located in a Village Center and along adjacent streets, totaling 125,000 square feet. The largest component, a small grocery store, would account for 30 percent of the space. General merchandise retailers, restaurants, and specialty retail are anticipated to account for 15 percent of the space each. Other retailers and business and personal services stores are each projected to account for 10 percent. About 5 percent of the space would be filled by home furnishings and appliances stores.

Sales at the HPS Phase II neighborhood retail component would total $41.3 million annually. Sales at the HPS Phase II neighborhood retail component would be concentrated in a Grocery Store, the Other Retail Stores category, Restaurants, and the General Merchandise category as those categories are defined in the CBRE Consulting analysis in Appendix U.

HPS Phase II market area household growth represents a major source of new demand for the planned retail and other area retailers. A total of 13,892 new households will be added to the HPS Phase II market area between 2009 and 2030, which includes the 10,500 units planned for the Project and the 1,600 units planned at Schlage Lock. The market analysis assumes that HPS Phase II market area retailers can reasonably expect to capture between 20 and 90 percent of the new household demand, depending on the retail category. Capture rates were estimated based on consumer spending patterns as well as the amount of existing retail offerings in the market area as opposed to offerings outside the market area. Applying these capture rates (refer to Exhibit 30 to Appendix U), HPS Phase II market area retailers would capture up to $116.9 million in sales generated by the new market area residents. The analysis further concludes that $13.8 million in new household demand is likely to be captured by the planned HPS Phase II neighborhood retail stores. This comprises approximately 12 percent of all available market area captured sales, and $103.1 million in new household demand would be available to offset any sales diverted from existing retailers as a result of HPS Phase II achieving its projected level of sales.

Another source of potential retail demand for new retail projects can be recaptured sales leakage from resident spending that is occurring outside the HPS Phase II market area. Exhibit 31 of Appendix U shows

that there is leakage in the relevant categories of General Merchandise, Eating and Drinking Places, and Other Retail Stores. It is assumed that only one-third of leakage in the market area in the relevant categories would be absorbed by new retail offerings as HPS Phase II. Given this conservative assumption, it is estimated that there would be $5.4 million of retail sales leakage in General Merchandise, $1.9 million in Eating and Drinking Places, and $9.8 million in Other Retail Stores available to HPS Phase II retailers.

The demand associated with new household growth is expected to absorb a large component of sales at the planned HPS Phase II neighborhood retail area in 2030, which represents the first full year of operations. New demand associated with household growth is estimated to account for $13.8 million of the Project's $41.3 million in market area sales (Market Area Sales Captured x Estimated Capture of Demand from New Households). The remaining $103.1 million in demand from new households (Market Area Sales Captured minus Estimated Capture of Demand from New Households – See Exhibit 30 of Appendix U) would be distributed among other market area stores, such that any potential impacts to existing stores would be fully offset. While these recaptured sales would occur to the detriment of other retailers outside the market area, there is still other remaining demand available to offset both these impacts and those in the market area. Therefore, no substantial impacts would occur to the detriment of existing retailers due to the proposed HPS Phase II neighborhood retail.

With respect to an analysis of sales impacts beyond the HPS Phase II market area, CBRE Consulting identified and analyzed neighborhood-oriented shopping nodes within San Francisco and in cities to the south. The analysis of neighborhood retail impacts utilizes the locations of mid-sized to larger Food Stores as an indicator of the distribution of local shopping areas near the HPS Phase II market area. Exhibit 36 of Appendix U presents a map of forty-four grocery stores located in San Francisco, Daly City, and South San Francisco. Three of these stores are within the HPS Phase II neighborhood market area. The remaining forty-one stores are viewed as potentially competitive with the Food Stores component of the proposed HPS Phase II retail development. Supermarkets and neighborhood retail centers typically draw customers from a 3- to 5-mile trade area. Seven of the forty-one stores were selected for detailed analysis, all within a 3-mile radius trade area:

- Whole Foods Market (399 4th Street, San Francisco)
- Foods Co. (1800 Folsom Street, San Francisco)
- Good Life Grocery (1524 20th Street, San Francisco)
- Delano IGA Market (1245 South Van Ness Avenue, San Francisco)
- Safeway (5290 Diamond Heights Boulevard, San Francisco)
- Safeway (4950 Mission Street, San Francisco)
- Safeway (30 Chestnut Avenue, South San Francisco)

Trade area household estimates range from 50,648 households for the Safeway in South San Francisco to 247,754 household for the Foods Co. supermarket on Folsom Street. As many as half of the households located within the overlap of a store's trade area and the HPS Phase II retail market area may shift their related purchases to the neighborhood retail component of the Project. For one of the stores, up to an estimated 7.7 percent of its 2009 trade area demand (equivalent to 9,861 households) and 7.7 percent of other neighborhood sales near this store may be diverted to the HPS Phase II neighborhood retail stores. For the other stores, the consumer base diversion would range from 0.8 percent to 4.9 percent, assuming a very conservative 50 percent shift in existing overlapping household demand. Based on household

growth projections for the market area, each of the representative store trade areas would be likely to experience sufficient levels of new demand to offset any projected sales diversions prior to 2030. None of the seven representative grocery stores or their surrounding local shopping nodes would experience a net loss in demand due to the opening of the planned HPS Phase II neighborhood retail component. In general, the level of trade area overlap, even for the most proximate grocery stores or neighborhoods, would not be substantial compared to the levels of household growth projected from 2009 to 2030.[1337]

Moreover, as shown in Exhibit 8 and Table 4 of Appendix U, about 10 percent of the tenant space (11,875 square feet) in the HPS Phase II neighborhood retail area is allocated to non-retail services businesses such as a bank branch or a dry cleaner. Since new household growth is estimated to create demand that is sufficient to offset potential retail sales impacts, it is likely that this incremental demand would also support the anticipated mix of neighborhood-oriented non-retail tenants without generating sales diversions from comparable businesses.

San Francisco and northern San Mateo County offer a diverse set of retail options, which serve local residents, daily commuters, out-of-town business travelers, and tourists. Despite recent declines in local retail sales, most of the regional- and neighborhood-shopping areas that CBRE Consulting visited had limited vacancies due to store closures, and with the exception of the South Bayshore area, retail properties were typically well maintained. In addition, the San Francisco metro area is viewed as a vibrant market, where many national retailers are continuing to expand. Based on the findings regarding the presence of new retail demand sufficient to support the HPS Phase II neighborhood retail, other cumulative retail projects, and/or backfill retail spaces vacated as a result of Project impacts, the HPS Phase II retail component would not cause or contribute to urban decay. This conclusion pertains to the HPS Phase II retail component on both an individual and cumulative basis.

Cumulative Impacts

This analysis quantifies the impact of the Project retail taking into consideration other planned competitive retail developments. The cumulative projects are those that are reasonably foreseeable to be open and have a first full year of retail operations by 2030. The approach for this analysis is the same as for the Project analysis: if the cumulative retail developments, including the planned Project retail, add sales to a retail category in an amount greater than the combination of estimated recaptured leakage in the category and the expected demand from new households, the remaining sales are estimated to be diverted from existing market area retailers. The cumulative projects and assumptions made in their selection are identified in Appendix U and Exhibits 44 and 46. Several cumulative projects are identified related to the Candlestick Point development, and one project, India Basin, is identified as a cumulative project with respect to the HPS Phase II component.

Based on the methodology in Appendix U and calculations shown in Exhibit 49, cumulative projects within and near the Candlestick Point market area would capture 7.6 percent of new household demand and contribute $263.8 million in estimated retail sales to the Candlestick Point market area by 2030.[1338] The

[1337] CBRE Consulting, September 2009.
[1338] Approximately $206.6 million in sales would be generated by projects in the Candlestick Point market area and $71.1 million would come from projects outside of but near the Candlestick Point market area. Refer to Exhibit 49.

estimated new household demand for retail estimated to be captured by the Candlestick Point regional center/neighborhood retail area in combination with the cumulative projects totals $35.5 million. The remaining new household demand, $389.2 million, is then reduced by the estimated HPS Phase II neighborhood retail sales, since the previous analysis found that all HPS Phase II sales would be offset by new household demand. The net remaining demand that would offset impacts to other existing retailers is $347.9 million (refer to Exhibit 55 of Appendix U). The Candlestick Point market area may experience up to $125.3 million in sales impacts in 2009 dollars that will likely be spread among many retailers. However, if certain retailers are affected disproportionately, store closures could occur. The final remaining new household demand in the Candlestick Point market area ($180.2 million) is in categories that could be re-tenanted by a retailer in a category with remaining new household demand. Therefore, any vacancies due to the Candlestick Point component and the cumulative projects would not remain empty for a prolonged period of time. The existing retail districts in the Candlestick Point market area, Leland Avenue, San Bruno Avenue, Third Street, and South Bayshore, also are unlikely to be negatively impacted by the Candlestick Point regional center and neighborhood retail area in combination with cumulative projects because their main retail categories are estimated to have minimal impacts. New household growth in the Candlestick Point market area and remaining demand in categories such as Restaurants, Food Stores, and Building Materials categories would be likely to benefit the existing retail districts.[1339]

Cumulative projects in the HPS Phase II market area would capture 9.1 percent of new household demand and contribute $12.7 million in retail sales to this market area. Approximately $14.8 million of new household demand for retail would be captured by the HPS Phase II neighborhood retail area in combination with the India Basin cumulative project. The remaining new household demand would be $102.1 million. The HPS Phase II market area may experience up to $0.4 million in sales impacts in 2009 dollars in the Other Retail Stores category. These impacts would be relatively small, accounting for only 1.0 percent of the market area sales base in this retail category, or 0.1 percent overall. These impacts would likely be spread among many retailers; however, if certain retailers are affected disproportionately, store closures could occur. If store closures were to occur, vacant spaces could be re-tenanted by a retailer in a category with remaining new household demand. Therefore, existing retail in the HPS Phase II market area would not be negatively impacted by the neighborhood retail planned at HPS Phase II and India Basin. Instead, new household growth in the HPS Phase II market area would likely benefit the existing retail uses.[1340]

Conclusion

As noted, above, new household demand by 2030, the assumed operational year of the Project retail developments, is anticipated to be sufficient to result in minimal anticipated negative sales impacts on existing retailers. There would be new demand due to household growth to support the Project's retail projects and recapture leakage relative to HPS Phase II, as well as existing retail developments both in the retail market areas and nearby (with shared market portions) that may experience some Project-related diverted sales. The planned Project retail components would not lead to the closure of existing retailers on a cumulative basis after consideration of demand generated by household growth. Despite identified plans

[1339] CBRE Consulting, September 2009.
[1340] CBRE Consulting, September 2009.

for 3.5 million square feet of cumulative retail development, the Project's retail components would not result in retail store impacts leading to prolonged retail store vacancy. While some stores could close as a result of diverted retail sales, sufficient retail demand is anticipated in other retail categories that would enable new or expanded retail establishments to "backfill" the resulting vacancies. Therefore, the existing retail commercial base is not anticipated to experience prolonged vacancy or other conditions likely to contribute to or lead to urban decay. The Project's impact on an individual and cumulative basis would be less than significant.

CHAPTER VI **Alternatives**

VI.A INTRODUCTION

VI.A.1 Legislative Framework

In accordance with CEQA Guidelines Section 15126.6, EIRs are required to include a discussion of alternatives to a proposed project. Section 15126.6(a) states that an EIR should describe a range of reasonable alternatives to a project that would attain most of the basic objectives of a project while reducing one or more of the significant impacts of the project, and should evaluate the comparative merits of those alternatives.

Public Resources Code Section 21002 states, in pertinent part:

> In determining the nature and scope of alternatives to be examined in an EIR, the Legislature has decreed that local agencies shall be guided by the doctrine of "feasibility." It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. In the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof.

California has declared that the statutory requirements for consideration of alternatives must be judged against a rule of reason. CEQA Guidelines Section 15126.6(f) defines the "Rule of Reason," which requires that an EIR set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only those that the lead agency determines could feasibly attain most of the basic objectives of the project. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR is *(i)* failure to meet most of the basic project objectives, *(ii)* infeasibility, or *(iii)* inability to offer substantial environmental advantages over the project proposal (CEQA Guidelines Section 15126.6(c)).

CEQA Guidelines Section 15126.6(e)(1) requires an analysis of the No Project Alternative. The purpose of describing and analyzing the No Project Alternative is to allow decision-makers to compare the impacts of approving the Project with the impacts of not approving the Project. CEQA Guidelines Section 15126.6(e)(3)(A) provides that "when the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the 'no project' alternative will be the continuation of the existing plan, policy or operation into the future." The No Project Alternative in this chapter discusses future conditions on the Project site if current planning controls continued in the future and no other Redevelopment actions or incentives were implemented.

CEQA Guidelines Section 15126.6(f)(1) states that "the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent)."

VI.A.2 Analytic Method

This chapter describes the Project alternatives and identifies potential environmental impacts associated with implementation of Project alternatives relative to the impacts of the Project. The Project variants discussed in Chapter IV (Project Variants) could be approved instead of the Project. Therefore, the alternatives analysis also includes a comparison of impacts of Project alternatives relative to the impacts of the variants. To identify reasonable alternatives to this Project, the Agency and the City, as co-Lead Agencies, considered the objectives of the Project, those alternatives that are feasible to accomplish, and those alternatives that could reduce one or more of the significant impacts of the Project.

The general process for identifying alternatives for consideration in the document included these steps:

1. Review the significant effects resulting from the Project and identify possible strategies to avoid or lessen such impacts
2. Review ideas and alternative concepts suggested during the Project scoping process and any presented to the lead agencies during the preparation of the DEIR
3. Categorize and evaluate strategies and concepts for the ability to meet the basic project objectives and avoid or lessen significant impacts
4. Develop preliminary alternatives based on the strategies and concepts retained from preliminary screening and evaluate feasibility with respect to technical, institutional, costs and regulatory considerations
5. Select and refine a final set of alternatives for CEQA analysis

From this process, four alternatives, in addition to the required No Project Alternative, were selected for further evaluation and comparison to the Project and the Project Variants. Together, this set of five alternatives represents a broad range of options in terms of how key aspects of the proposed Project could be implemented. Each alternative differs from the Project in one or more of the following ways:

1. In the treatment of the Yosemite Slough bridge, either by changing the design or removing the Bridge proposal from the project and substituting an alternative transportation component
2. In the intensity of development
3. In the location and type of land uses
4. In the treatment of the Candlestick Point State Recreation Area (CPSRA), either by changing the reconfiguration proposed or removing the CPSRA from the project
5. In the treatment of the 49ers Stadium, either by changing the location of the Stadium or removing the Stadium from the project

The alternatives selected were judged the best to represent the range of identified strategies and concepts. Mitigation measures that have been identified for Project impacts would apply to impacts of the alternatives if the alternatives analysis indicates that mitigation is required to minimize a similar significant impact.

VI.A.3 Project Objectives

Project alternatives were evaluated for their ability to attain most of the basic objectives of the proposed Project, consistent with CEQA. Project objectives are identified in Chapter II (Project Description) and are summarized below.

- The integrated development should produce tangible community benefits for the Bayview and the City
- The integrated development should reconnect Candlestick Point and the HPS site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents
- The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and include the rebuilding of Alice Griffith Public Housing
- The integrated development should incorporate environmental sustainability concepts and practices
- The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure
- The integrated development should be fiscally prudent, with or without a new stadium

Project objectives are described in more detail in the Chapter II.

VI.B DESCRIPTION OF ALTERNATIVES TO THE PROJECT

Five alternatives to the Project have been evaluated, including the No Project Alternative, as required by CEQA, an alternative that presents the same development program as the Project, but without building a bridge over the Yosemite Slough, and three different reduced development alternatives. The alternatives considered include the following:

- **Alternative 1: No Project**—Consistent with Section 15126.6(e)(1) of the CEQA Guidelines, this alternative assumes that no new development would occur at Candlestick Point and HPS Phase II would be developed with new uses consistent with the existing *Hunters Point Shipyard Redevelopment Project* (HPS Redevelopment Plan).

  This alternative was selected in accordance with CEQA Guidelines Section 15126.6(e)(3)(A), which states that when the project is the revision of an existing land use or regulatory plan, policy, or ongoing operation, the "no project" alternative would be the continuation of the existing plan, policy, or operation into the future. This discussion would allow the decision-makers to compare the impacts of approving the Project with the impacts of not approving the Project.
- **Alternative 2: CP-HPS Phase II Development Plan; No Yosemite Slough Bridge**—Alternative 2 would have the same land use program proposed with the Project, including the State Parks agreement. Alternative 2 would not include the Yosemite Slough bridge. The main roadway connection between Candlestick Point and HPS Phase II would be via Ingalls Street. A bus rapid transit (BRT) route would be constructed along an abandoned railroad right-of-way to provide access between Candlestick Point and HPS Phase II. This alternative assumes that the 49ers Stadium is relocated to HPS Phase II and the Agency enters into an agreement with CPSRA to reconfigure CPSRA land in the same way as for the Project.

  This alternative was selected to avoid impacts to biological and scenic resources associated with bridge construction and operation, although these Project impacts were identified as less than significant. Significant traffic, noise, and air quality impacts would not be reduced. This alternative

would result in greater transportation-related impacts on game days because vehicular ingress and egress to and from the stadium would be delayed and traffic levels would be increased on local streets, including Innes Avenue, Evans Avenue, and Ingalls Street.

- **Alternative 3: Reduced CP-HPS Phase II Development; San Francisco 49ers Stay at Existing Candlestick Park Stadium; Limited State Parks Agreement; Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians**—Alternative 3 would be a reduced development alternative. Total housing with this alternative would be 5,210 units, about half of the units proposed with the Project. At Candlestick Point, residential development would be decreased and retail and arena uses would not be developed. Replacement of the Alice Griffith Public Housing site would occur and consist of 1,210 housing units. Minor improvements would be made to the CPSRA under the Limited State Parks Agreement. At HPS Phase II, housing would be increased; other uses at HPS Phase II would be similar to the Project. A new Yosemite Slough bridge serving only transit, bike, and pedestrian traffic would extend Arelious Walker Drive from Candlestick Point to HPS Phase II. This alternative assumes that the 49ers football team would continue to use the existing Candlestick Park stadium. At HPS Phase II, the alternative would not include a new 49ers Stadium.

  This alternative was selected to provide an alternative to the Project that reduces construction-related impacts generally and operational impacts associated with traffic, air quality, noise, demand for public services, biological resources, and other growth-related impacts. The development program of this alternative would be reduced compared to the Project and would generate fewer vehicle trips and reduce the area subject to development. This alternative would reduce traffic and noise impacts associated with an increase in vehicle trips and air quality impacts associated with Project construction and operation. This alternative would reduce impacts to biological resources associated with bridge construction and operation as a result of the narrower bridge footprint and reduced bridge traffic. Construction and/or operational impacts related to the amount of development and the development footprint, such as soil erosion and stormwater runoff, as well as operational impacts related to population and employment growth, such as police and fire services, would also be reduced by this alternative.

- **Alternative 4: Reduced CP-HPS Phase II Development; Historic Preservation; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge**—Alternative 4 would also be a reduced development alternative. Total housing with this alternative would be 7,350 units, about 30 percent less than proposed with the Project. The proposed floor areas for most uses would be approximately 30 percent smaller at full build-out in comparison to build-out of the Project. This alternative includes preservation of five potentially historic structures at HPS Phase II.[1341] No Yosemite Slough bridge, stadium, or marina would be built. The State Parks agreement would occur.

  This alternative was selected to include historic preservation of the five eligible structures on HPS and to provide a reduced development alternative to the Project. This alternative would reduce the area subject to development and would avoid significant impacts to historic resources at HPS Phase II. Reduced development would result in fewer vehicle trips. This alternative would reduce traffic and noise impacts associated with the increase in vehicle trips and air quality impacts associated with Project operation and construction. This alternative would also avoid impacts to biological resources associated with bridge construction and operation. Construction and/or operational impacts related to the amount of development and the development footprint, such as soil erosion and stormwater runoff, as well as operational impacts related to population and employment growth, such as police and fire services, would also be reduced by this alternative.

[1341] Since publication of the Draft EIR, the Project has been revised to incorporate preservation of Building 208.

- > **Subalternative 4A: CP-HPS Phase II Development Plan with Historic Preservation**—This subalternative to Alternative 4 retains all of the historic buildings, but includes the same land use plan as described for the Project rather than a reduced development plan as under Alternative 4. The Project's land use plan would be implemented under this alternative in terms of total square footage of land uses and district locations. However, unlike the Project, Buildings 211, 224, 231, and 253 would be retained. The R&D square footage that, under the Project, would be built at the location of Buildings 211, 224, 231, and 253 would be distributed throughout other areas of the HPS Phase II development. Consequently, under this subalternative, the total floor area for R&D would remain the same as the Project, at 2,500,000 sf. However, the building heights in the R&D District on HPS Phase II would increase to accommodate the displaced square footage. Buildings 211, 231, and 253 would be rehabilitated under the Secretary of Interior's Standards to accommodate approximately 338,000 gsf of R&D and 1,000 parking spaces. Building 224, the air raid shelter, would be rehabilitated to provide museum space.
- Subalternative 4A would also retain existing grades, allowing railroad spurs and other historic elements to remain. A wave protection berm is proposed to accommodate a 36-inch sea level rise. The Bay Trail would run on top of the berm, which would be designed to include seat steps. All other components of Subalternative 4A would remain the same as under the Project.

■ **Alternative 5: Reduced CP-HPS Phase II Development; No HPS Phase II Stadium, State Parks Agreement, or Yosemite Slough Bridge**—Alternative 5 would have the same land use program proposed with the Project, except that the new stadium at HPS Phase II and the Yosemite Slough bridge would not be constructed and the 49ers would continue to utilize Candlestick Park. The total number of housing units would be the same as for the Project; however, because this alternative would not include the CPSRA boundary reconfiguration, the land area available for development would be smaller. Approximately 1,350 units would be shifted from Candlestick Point to HPS Phase II. This alternative assumes a State Parks agreement does not occur and there is no agreement with the 49ers for a stadium at the Project site.

This alternative was selected to reduce construction impacts generally and to avoid impacts to biological resources associated with bridge construction and operation. Significant traffic, noise, and air quality impacts would not be reduced. Construction impacts that relate to the size of the development footprint would also be reduced by this alternative.

Alternatives 2 through 5 are depicted in Figure VI-1 (Alternative 2 Circulation Plan Railroad Right-of-Way for Bus Rapid Transit), Figure VI-2 (Alternative 3 Land Use Plan), Figure VI-3 (Alternative 4 Land Use Plan), and Figure VI-4 (Alternative 5 Land Use Plan).

Consistent with the analysis of Project impacts, the primary focus of this alternatives analysis is the physical development that could occur, rather than the policy framework required of or by that development. The alternatives identified above consider a range of different types, sizes, or locations of physical development and the physical properties of these alternatives (including the amount and location of such development and the employment and housing provided by this development) that could result in physical effects to the environment. The analysis of potential impacts assumes that each alternative would comply with applicable Project requirements and implement all feasible mitigation measures. Only those impacts that were identified as less than significant or significant and unavoidable for the Project are compared to alternatives impacts in this analysis, except where the alternative would have an impact but the Project analysis identified no impact. Further, for purposes of comparison, where significant and unavoidable impacts were identified for the Project, the impact for the same threshold for each of the alternatives is identified by

both significance level and whether the impact is greater than, similar to, or less than the impact of the Project, even if the level of significance does not change.

VI.C ANALYSIS OF PROJECT ALTERNATIVES

This section provides an analysis of the environmental impacts of each of the alternatives, including a comparison of the potential impacts of the alternative to the Project's less-than-significant and significant and unavoidable impacts, as well as the impacts that would result from implementation of the Project alternatives themselves. For each alternative, it is assumed that relevant Project requirements and/or mitigation measures identified for the Project would be implemented, if required to reduce the impacts for the alternative. Table VI-1 (Summary of Project Alternatives) presents a summary of the alternatives compared to the Project.

Table VI-1 Summary of Project Alternatives

Use	*Project*	*Alternative 1 No Project*[a]	*Alternative 2 No Bridge Alt*	*Alternative 3 49ers at Candlestick*	*Alternative 4 Lesser Build*	*Subalternative 4A: CP-HPS Phase II Development Plan with Historic Preservation*	*Alternative 5 No Park Agreement*
Candlestick Point							
Residential (units)	7,850	0	7,850	1,210	5,495	7,850	6,500
Retail (gsf):							
Regional Retail	635,000	0	635,000	0	444,500	635,000	635,000
Neighborhood Retail	125,000	0	125,000	0	87,500	125,000	125,000
Retail Subtotal (gsf)	*760,000*	*0*	*760,000*	*0*	*532,000*	760,000	*760,000*
Community Services (gsf)	50,000	0	50,000	0	50,000	50,000	50,000
Hotel (gsf)[a]	150,000	0	150,000	0	105,000	150,000	150,000
Office (gsf)	150,000	0	150,000	0	105,000	150,000	150,000
10,000-seat Arena (gsf)	75,000	0	75,000	0	75,000	75,000	75,000
Football Stadium (seats)	0	70,000	0	70,000	0	0	70,000
HPS Phase II							
Residential (units)	2,650	1,800[b]	2,650	4,000	1,855	2,650	4,000
Neighborhood Retail (gsf)	125,000	570,000	125,000	125,000	87,500	125,000	125,000
Research & Development (gsf)	2,500,000	1,087,000	2,500,000	2,500,000	1,750,000	2,500,000	2,500,000
Artists' Studios (gsf):							
1:1 Studio Renovation and Replacement (gsf)[c]	225,000	225,000	225,000	225,000	225,000	225,000	225,000

Table VI-1 Summary of Project Alternatives

Use	*Project*	*Alternative 1 No Project*[a]	*Alternative 2 No Bridge Alt*	*Alternative 3 49ers at Candlestick*	*Alternative 4 Lesser Build*	*Subalternative 4A: CP-HPS Phase II Development Plan with Historic Preservation*	*Alternative 5 No Park Agreement*
New Artist Center (gsf)	30,000	0	30,000	30,000	30,000	30,000	30,000
Artist Studio Subtotal (gsf)	*255,000*	*225,000*	*255,000*	*255,000*	*255,000*	255,000	*255,000*
Community Services (gsf)	50,000	0	50,000	50,000	50,000	50,000	50,000
Football Stadium (seats)	69,000	0	69,000	0	0	69,000	0
Mixed-Use	0	580,000	0	0	0	0	0
Cultural and Education	0	330,600	0	0	0	0	0
Marina (slips)	300	0	300	300	0	300	300
Other Elements							
Yosemite Slough bridge	Bridge	No bridge	No bridge	BRT/Pedestrian bridge	No bridge	Bridge	No bridge
Shoreline Improvements	Yes	No	Yes	Yes	Yes	Yes	Yes
State Parks Agreement/total acres of State Parkland	Yes/96.7	No/120.2	Yes/96.7	Yes/117.2[d]	Yes/96.7	Yes/96.7	No/120.2

SOURCE: Lennar Urban, PBS&J, 2009.

a. Hotel uses include 220 rooms at the proposed Regional Retail Center.
b. 1,800 housing units on the entire Shipyard including the Phase I site.
c. Existing artist studios would be replaced at a one-to-one ratio under all alternatives.
d. Limited exchange of 3.03 acres to construct BRT/pedestrian only Yosemite Slough bridge and Alice Griffith Public Housing

VI.C.1 Alternative 1: No Project

Summarized Description

Alternative 1 assumes that the build-out allowed under Proposition G, the voter-approved initiative that enabled the Project, would not be pursued. Development regulations and zoning would revert to the regulations that were in place prior to passage of Propositions D and F and establishment of the Candlestick Point Special Use District.[1342] The Yosemite Slough bridge would not be constructed, and the circulation network would not be altered. No new uses would be constructed at Candlestick Point. Development at HPS Phase II would proceed under land use plans and controls adopted as part of the HPS Redevelopment Plan, described in detail below and shown in Table III.B-5. Table VI-2 (Comparison of Alternative 1 and Project Build-Out) provides a comparison of the uses proposed in the Project site under the Project and Alternative 1.

[1342] Note that the Candlestick Point Special Use District was repealed by passage of Proposition G in June 2008.

Table VI-2 Comparison of Alternative 1 and Project Build-Out

Use	*Alternative 1*	*Project*	*Comparison to Project*
Candlestick Point			
Residential (units)	0	7,850	-7,850
Retail (gsf):			
Regional Retail	0	635,000	-635,000
Neighborhood Retail	0	125,000	-125,000
Community Services	0	50,000	-50,000
Hotel (gsf)	0	150,000	-150,000
Office (gsf)	0	150,000	-150,000
10,000-seat Arena (gsf)	0	75,000	-75,000
Football Stadium (seats)	70,000	0	70,000
HPS Phase II			
Residential (units)	1,800[a]	2,650	-850
Neighborhood Retail (gsf)	570,000	125,000	+445,000
Research & Development (gsf)	1,087,000	2,500,000	-1,413,000
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	0	30,000	-30,000
Community Services	0	50,000	-50,000
Football Stadium (seats)	0	69,000	-69,000
Mixed Use	580,000	0	580,000
Cultural and Education	330,600	0	330,600
Other Elements			
Yosemite Slough bridge	No	Yes	-
Marina	No	Yes	-
State Park Agreement/total acres of State Parkland	No/120.2	Yes/96.7	+23.5

SOURCE: Lennar Urban, PBS&J, 2009.
a. 1,800 housing units on the entire Shipyard including the Phase I site.

Detailed Description

Candlestick Point

Under Alternative 1, no new development would occur at Candlestick Point. The Alice Griffith Public Housing complex would not be replaced, and the Candlestick Park stadium would continue to function as under existing conditions. The CPSRA land agreement between the Candlestick Point and HPS Phase II sites would not be pursued. No new open space would be developed at this site and no improvements of the existing open space would occur.

HPS Phase II

Alternative 1 assumes that HPS Phase II would be developed with new uses consistent with the existing HPS Redevelopment Plan. Under these land use controls, this alternative would result in construction of up to 1,800 new housing units (on the entire Shipyard, including the Phase I site), approximately 570,000 gross square feet (gsf) of neighborhood commercial space, 1,087,000 gsf of R&D space, and one-to-one replacement of existing artist studios. This alternative would also include 580,000 gsf of mixed-use development and 330,600 gsf of cultural and educational space, uses not proposed under the Project. The HPS Redevelopment Plan also allows maritime industrial uses. The San Francisco 49ers football stadium would not be relocated to HPS Phase II, and the community services and artist center proposed under the Project would not be constructed at this site.

Basis for Impact Analysis

For the Project, the potential impacts are generally based on the parameters of the Project, which include the size, bulk, and type of development, the footprint of development, and the number of residents, employees, and visitors to the Project site. For Alternative 1, the impacts of the Project are compared to the impacts that would occur with new development at HPS Phase II consistent with the existing HPS Redevelopment Plan and Hunters Point Shipyard Design for Development (Hunters Point Shipyard D4D).[1343,1344] Furthermore, development under Alternative 1 at HPS Phase II would be subject to the mitigation measures adopted with certification of the *Final Environmental Impact Statement* (EIS) *for Disposal and Reuse of Hunters Point Shipyard* (Hunters Point Shipyard Final EIR).[1345] Development at HPS Phase II under Alternative 1 would also be subject to the requirements of the City's *Municipal Code*. Under Alternative 1, no development would occur at Candlestick Point and the existing uses and site conditions would remain as they are currently. The Yosemite Slough bridge and San Francisco 49ers stadium would not be constructed under any future development scenarios considered for Alternative 1.

Potential Impacts

Land Use and Plans

Implementation of Alternative 1 would not require amendments to the HPS Redevelopment Plan or other planning and policy documents. Development would be subject to the mitigation measures adopted for the Hunters Point Shipyard Redevelopment Plan. Development under Alternative 1 would not conflict

[1343] San Francisco Redevelopment Agency, *Redevelopment Plan for the Hunters Point Shipyard Redevelopment Project*, July 14, 1997. A copy of this document is available for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.
[1344] San Francisco Redevelopment Agency and San Francisco Planning Department, *Design for Development, Hunters Point Shipyard Redevelopment Project*, December 9, 2004. A copy of this document is available for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.
[1345] Navy, *Final Environmental Impact Statement for Disposal and Reuse of Hunters Point Shipyard*, November 20, 2000. A copy of this document is available for public review at the San Francisco Redevelopment Agency, One South Van Ness Avenue, Fifth Floor as part of File No. ER06.05.07, or at the City Planning Department, 1650 Mission Street, Fourth Floor, San Francisco, CA, 94103 as part of File No. 2007.0946E.

with applicable land use plans, policies, or regulations (of an agency with jurisdiction) adopted for the purpose of avoiding or mitigating an environmental effect and this impact would be less than significant, the same as for the Project.

Implementation of Alternative 1 would not result in a substantial adverse change in the existing land use character. Development under Alternative 1 could change the character of the HPS Phase II site from industrial uses to mixed-use, industrial, R&D, cultural/educational, and open space uses in accordance with the HPS Redevelopment Plan. However, the range of uses at HPS Phase II would not result in a substantial adverse change in the existing land use character of the Project site. Therefore, similar to the Project, this impact would be less than significant. However, without development at Candlestick Point, the deteriorated conditions throughout much of the site would remain and the beneficial effects of the Project on improving the character of the site would not occur. Therefore, while the overall changes resulting from development under Alternative 1 would not be considered adverse, the limited changes would not allow for the overall benefits of the Project.

Population, Housing, and Employment

Construction activities associated with implementation of Alternative 1 would induce direct job growth at HPS Phase II. The number of construction workers that would be employed during the construction period would be less than the Project because construction at Candlestick Point would not occur, and the Yosemite Slough bridge and the San Francisco 49ers stadium would not be constructed. It is anticipated that construction employees would commute from elsewhere in the region, rather than relocate to the Bayview Hunters Point neighborhood for a temporary construction assignment. Thus, construction under this Alternative would not generate a substantial, unplanned population increase. Similar to the Project, direct and indirect impacts associated with construction employment would be less than significant; however, impacts would be even less than under the Project.

Implementation of Alternative 1 would induce direct and indirect population growth, but this growth would not be considered substantial. Development under this Alternative would not result in new housing at Candlestick Point, but would result in up to 1,800 units at the Shipyard (including Phase I). Employment growth generated by this Alternative would result in the demand for 6,773 new housing units, less than the total number of new housing units that would be provided. There would be over three times as many jobs provided as housing units (approximately 6,200 jobs compared to 1,800 housing units), which could result in indirect residential growth in the surrounding Bayview Hunters Point neighborhood. Although the residential units currently under construction at HPS Phase I would supplement this demand, the demand would still not be met. Therefore, the deficit in housing would result in a significant and unavoidable impact that does not occur with the Project.

Transportation and Circulation

Alternative 1 transportation effects would be those presented for the 2030 No Project conditions presented in Section III.D (Transportation and Circulation); development consistent with the 1997 HPS Redevelopment Plan and other growth would be projected to occur by 2030.

The Transportation Study analyzed Alternative 1 and conclusions from the Transportation Study are presented below.

Construction Impacts

- Construction activities associated with Alternative 1 would be reduced compared to the Project, depending on the phasing of the development. Localized construction-related traffic impacts would be less than significant under Alternative 1.

Intersection Conditions

Alternative 1, 2030 No Project conditions would have cumulative effects at 38 study intersections. With Alternative 1, 39 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, and Sunday PM peak hours, compared to three intersections under existing conditions, and 44 intersections with the Project. In addition, 2030 No Project Conditions would not include transportation improvements proposed as part of the Project. Section III.D discusses traffic effects at study intersections, and the feasibility of mitigation measures. In general, intersection conditions would be significant and unavoidable effects of the No Project Alternative.

Freeway Conditions

Alternative 1 freeway mainline sections effects, freeway ramp junction conditions, and ramp queuing effects would be similar to the Project conditions, with significant and unavoidable impacts.

Transit Impacts

Alternative 1 transit conditions assume implementation of the proposed SFMTA Transit Effectiveness Program (TEP), but no other Project-related transit improvements. Alternative 1 would have a less than significant impact on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with 2030 No Project would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. As concluded in Section III.D, the transit delay effects would remain significant and unavoidable. During the AM and PM peak hour, Alternative 1 would require 16 additional vehicles on the same routes as the Project, compared to up to 28 vehicles with the Project.

Parking Impacts

Alternative 1, assuming buildout of the 1997 HPS Redevelopment Plan, would result in a demand for about 9,150 spaces, compared with a maximum permitted supply of about 6,730 spaces; therefore, the maximum off-street parking supply would be about 2,420 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. Parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact under CEQA, but rather a social effect. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area,

shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Alternative 1 impacts on parking would be less than significant.

This alternative would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

The development program for HPS Phase II under the existing HPS Redevelopment Plan is substantially less than the development program for HPS Phase II under the Project. Therefore, construction-related impacts to scenic vistas, visual character or quality, and light and glare would be reduced compared to the Project, as the overall construction period and intensity at the HPS Phase II site would be reduced. In addition, all construction-related impacts at Candlestick Point would be avoided because construction would not occur on that portion of the site. Similar to the Project, all construction lighting at the HPS Phase II site would be required to comply with City of San Francisco lighting requirements. Therefore, similar to the Project, this impact would be less than significant; however, impacts would be more limited than under the Project.

Development at the HPS Phase II site under Alternative 1 would be subject to the Hunters Point Shipyard D4D, which establishes development guidelines for uses, bulk and mass, architecture, street design, signage, and parking. The Hunters Point Shipyard D4D limits all development at HPS Phase II to a maximum height of 65 feet, substantially less than the stadium and residential towers up to 370 feet proposed under the Project. There are no scenic resources on the HPS Phase II site that would be adversely affected by implementation of Alternative 1, similar to the Project. Thus, while the Project would not substantially obstruct views across the site or result in a substantial adverse effect on any scenic vistas, Alternative 1, since it would involve lower building heights and less development, would reduce this impact further. Similar to the Project, Alternative 1 would not substantially degrade the visual character or quality of the site, because development would comply with the Hunters Point Shipyard D4, as noted. Compliance with City requirements and the Hunters Point Shipyard D4D would ensure that impacts to scenic resources, visual character or quality, and light and glare would be less than significant, and less than under the Project.

Shadows

Since development under Alternative 1 would only occur at the HPS Phase II site, no new shading would occur at Candlestick Point. New shadows from development at HPS Phase II would be substantially reduced compared to the Project, because building heights would be limited to 65 feet and the overall development program would be reduced. Development under Alternative 1 would be subject to *Planning Code* Section 295, which only applies to new structures over 40 feet in height that would add shade to San Francisco Recreation and Parks Department (SFRPD) property between one hour after sunrise to one hour before sunset at any time of year. The only existing SFRPD properties in the vicinity of the HPS Phase II site are the India Basin Shoreline Park and India Basin Open Space. These areas are to the north of the HPS Phase II site, and the nearest development under Alternative 1 would have maximum heights of 55 to 65 feet. New shade created by implementation of Alternative 1 would occur at limited times of the day and year, and would not substantially affect the use of open space facilities at HPS Phase II. Similar to the Project, this impact would be less than significant; however, impacts would be even less than under the Project.

Wind

Development at HPS Phase II under Alternative 1 would not include structures above 65 feet in height. These structures would not extend far above surrounding existing buildings. Wind hazards would not be created at Candlestick Point because development would not occur at this site under Alternative 1. The Hunters Point Shipyard D4D would ensure pedestrian safety in pedestrian-access areas at HPS Phase II. Similar to the Project, wind impacts would be less than significant; however, impacts would be even less than under the Project.

Air Quality

Alternative 1 does not involve any development at Candlestick Point, and considerably less development would occur at HPS Phase II. No new stadium would be constructed, and the State Parks agreement would not occur. As development would be considerably less than under the Project, the potential air quality impacts would be less than the Project.

Construction activities for Alternative 1 would generate dust; however, they would need to comply with the *San Francisco Health Code* and BAAQMD requirements. A mitigation measure was adopted with certification of the Hunters Point Shipyard Final EIR that would require the Applicant to ensure that construction contractors comply with the dust control strategies included in an approved site-specific dust control plan, which would reduce the impacts caused by construction dust to a less-than-significant level.

Construction activities could also create diesel particulate emissions (DPM); however, as the development of Alternative 1 would be considerably smaller than the Project, this impact would likely remain less than significant. Construction activities could also generate toxic air contaminants (TAC) containing PM_{10}; however, as there would be fewer construction activities for Alternative 1, this impact would be less than significant.

Though operational emissions associated with Alternative 1 would be much lower than with the Project, due to the scale of Alternative 1, the mass emissions would exceed the BAAQMD CEQA thresholds. Therefore this impact would remain significant and unavoidable, similar to the Project. Alternative 1 has reduced R&D square footage and potential TAC emissions from facilities in R&D areas would also be reduced. With the implementation of a mitigation measure adopted with certification of the Hunters Point Shipyard Final EIR requiring evaluation of and permitting of all stationary sources of TACs, this impact would be less than significant, and less than the Project.

Additionally, as the scale of Alternative 1 would be smaller than the Project, the impacts from Alternative 1 traffic (e.g., carbon monoxide and $PM_{2.5}$) would be less than significant and less than the Project.

According to the current BAAQMD CEQA Guidelines, odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD regards as having the potential to generate considerable odors include: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries and chemical plants. Alternative 1 would be a large mixed-use development containing residential, office, retail, R&D, recreational, and entertainment uses. Although there may be some potential for small-scale, localized odor issues to emerge around proposed sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site

and off-site sensitive receptors would be unlikely and would be resolved by interventions after receipt of any complaints. This would be a less-than-significant impact. No mitigation is required.

The Project is consistent with regional air quality plans; therefore, as Alternative 1 would be smaller than the Project, it would remain consistent with these plans. Alternative 1 promotes the use of alternative transportation modes, such as transit, biking and walking. In addition, it puts housing in close proximity with jobs and retail establishments, reducing the length of trips and further reducing reliance on single-occupancy vehicles. Therefore, Alternative 1 conforms to the regional air quality plan and there would be a less-than-significant impact. No mitigation is required.

Noise

Under Alternative 1 no development would occur at Candlestick Point, and considerably less development would occur at HPS Phase II. No new stadium would be constructed, and the State Parks agreement would not occur. As development would be considerably less than under the Project, the potential noise impacts would be less than the Project.

Construction activities for Alternative 1 would expose sensitive receptors to increased noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which generally prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Compliance with Sections 2907 and 2908 of the *Municipal Code*, which require implementation of construction Best Management Practices to reduce construction noise and limit the hours of construction, would reduce any potentially significant impacts to less-than-significant levels, the same as for the Project.

Construction activities for Alternative 1 would result in a temporary or periodic increase in ambient noise that would be noticeable and likely cause for human annoyance. Construction activities would occur within 25 feet of existing and future residential uses. Pile driving activities could result in substantial noise levels of up to 107 dBA at new residential uses on the site or at adjacent existing residences. Construction-related temporary increases in ambient noise levels would be considered significant and unavoidable, the same as for the Project.

Construction activities could also create excessive groundborne vibration levels at proposed on-site residential uses, should the dwelling units be occupied before construction activity on adjacent parcels is complete. Compliance with Sections 2907 and 2908 of the Municipal Code would require implementation of construction Best Management Practices and limit the hours of construction. However, it is anticipated that construction activities would occur within 50 feet of vibration-sensitive receptors and, therefore, vibration levels would exceed the threshold for human annoyance (approximately 80 VdB). Compliance with Sections 2907 and 2908 of the *Municipal Code* would reduce vibration impacts under Alternative 1, but not to a less-than-significant level; therefore, this impact would remain significant and unavoidable, but less than the Project because fewer construction activities would be required.

Daily operation of Alternative 1, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities

associated with Alternative 1, such as truck deliveries, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of Alternative 1 would generate increased local traffic volumes that would cause a permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Noise level increases associated with Alternative 1 would be less than the Project due to less development, and significant impacts along Carroll Avenue, Gilman Avenue, and Jamestown Avenue would be eliminated, as no development would occur at Candlestick Point. This impact would be less than significant, and less than the Project.

Because Alternative 1 would not include a football stadium, the significant and unavoidable noise impacts identified for the Project from football games and concerts would not occur with implementation of Alternative 1.

Cultural Resources

Construction activities associated with Alternative 1 could result in a substantial adverse change in the significance of paleontological resources. Compared to the Project, these potential impacts would be limited to the HPS Phase II site only. Construction activities at HPS Phase II under the Project would be required to implement a mitigation measure (MM CP-3a) that would reduce potential impacts to paleontological resources through a *Paleontological Resources Monitoring and Mitigation Program*. Construction activities under Alternative 1 would be subject to the mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR. However, as no mitigation to reduce impacts to paleontological resources was adopted with certification of the Hunters Point Shipyard Final EIR, implementation of Alternative 1 could result in a substantial adverse change in the significance of paleontological resources, which would be a greater than the less-than-significant impact identified for the Project.

Construction activities associated with Alternative 1 could result in a substantial adverse change in the significance of archaeological resources. Unlike the Project, these potential impacts would be limited to the HPS Phase II site only. The HPS Phase II site is likely to contain subsurface archaeological resources from the Native American, Chinese fishing village, prehistoric, and maritime development periods. A mitigation measure was adopted with certification of the Hunters Point Shipyard Final EIR that would reduce potential impacts to archaeological resources through implementation of a treatment and monitoring program. Implementation of this measure would reduce the effects of Alternative 1 on archaeological resources to a less-than-significant level, which would be similar to the Project.

Implementation of Alternative 1 would retain Drydocks 2 and 3 and rehabilitate Buildings 140, 204, 205, and 207 at the HPS Phase II site. A mitigation measure was adopted with certification of the Hunters Point Shipyard Final EIR that would require that these resources be retained and any alterations that would affect the historic resources be implemented according to the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. However, development under Alternative 1 would result in the demolition of Buildings 211, 231, and 253, which have been identified in this EIR as historic resources in the potential expansion of the Hunters Point Commercial Dry Dock and Naval Shipyard Historic District to include Drydock 4 and contributing buildings. This would result in a significant impact, since the proposed actions would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility

for inclusion in the California Register of Historic Resources (CRHR). A mitigation measure to reduce impacts to these resources was not adopted with certification of the Hunters Point Shipyard Final EIR. Therefore, implementation of Alternative 1 would, like the Project, result in a substantial unavoidable adverse change in the significance of historic resources.

Hazards and Hazardous Materials

The potential hazardous materials impacts for development under Alternative 1 would only occur as a result of construction activities at the HPS Phase II site. Development under the existing HPS Redevelopment Plan would have a footprint comparable to the Project (for the HPS Phase II site) and would require similar construction activities. For development under Alternative 1, potential hazardous material impacts would be addressed through mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR. The mitigation measures address the following hazardous materials issue at the site: reuse prior to complete remediation; construction prior to remediation; reuse after complete remediation; construction after remediation; discovery of previously unknown contamination; ecological exposure; contamination of aquifers; and handling of naturally occurring asbestos. Similar to the Project, development under Alternative 1 would also be subject to the federal, state, and local requirements regulating the investigation and cleanup of hazardous materials contamination identified in Section III.K (Hazards and Hazardous Materials) of this EIR. Implementation of mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR, along with compliance with applicable regulations, would reduce potential hazardous materials impacts to less-than-significant levels.

Similar to the Project, after development under Alternative 1, land uses at the HPS Phase II site would involve the routine use, storage, transportation, and disposal of hazardous materials, but it would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Through compliance with the identified requirements (including adherence to applicable federal, state, and local regulations related to the use, storage and transport of such materials), no significant hazard to the public or the environment is anticipated to occur for development under Alternative 1. Similar to the Project, this impact would be less than significant.

Geology and Soils

Potential soil erosion impacts under development of Alternative 1 could occur as a result of construction activities at the HPS Phase II site only. Development under the existing HPS Redevelopment Plan would have a footprint comparable to the Project (for the HPS Phase II site) and would require similar construction activities. Similar to the Project, construction activities, such as removal of paved areas, grading, and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. The Hunters Point Shipyard Final EIR did not include mitigation measures to reduce soil erosion impacts. However, construction activities would be required to implement Best Management Practices (BMPs) through the City's permitting process. The BMPs would stabilize soils in construction areas and reduce soil erosion impacts.

The potential for exposure to adverse effects caused by seismic groundshaking and seismically induced ground failure such as liquefaction, lateral spreading, landslides and settlement exists at the Project site for development under Alternative 1. Development under Alternative 1 would incorporate appropriate

engineering practices to ensure seismic stability of all structures and improvements as required by state and local building code requirements. The potential for adverse effects caused by landslides, settlement, expansive and corrosive soils also exists. Compliance with the requirements of the *Building Code* would reduce all impacts to less than significant, similar to the Project.

Hydrology and Water Quality

The footprint and extent of development for Alternative 1 would be reduced compared to the Project, because no State Parks agreement would occur, the Yosemite Slough Bridge would not be constructed, and no new uses would be constructed at Candlestick Point. Development at HPS Phase II would be limited to land uses proposed and approved under the HPS Redevelopment Plan. As such, impacts from construction and operation of the Alternative 1 would be less than the Project.

With adherence to applicable regulatory requirements, construction activities associated with Alternative 1 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. For development under Alternative 1, potential impacts associated with violation of water quality standards would be addressed through mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR. The mitigation measures address stormwater Best Management Practices (BMPs). Similar to the Project, development under Alternative 1 would also be subject to the federal, state, and local requirements regulating discharges to receiving water bodies identified in Section III.M (Hydrology and Water Quality) of this EIR. Implementation of mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR, along with compliance with applicable regulations, would reduce potential impacts to less-than-significant levels.

Construction activities associated with Alternative 1 would include excavation for building foundations and underground utilities, which could require short-term and/or long-term dewatering of the affected areas. As no extensive excavation is proposed for Alternative 1, the installation of underground building elements and utilities would not substantially alter groundwater levels, similar to the Project. As such, Alternative 1 would not substantially deplete groundwater supplies and would result in a less-than-significant impact, similar to the Project. As the total amount of open space under Alternative 1 is reduced compared to the Project, the amount of permeable surface within the Project area would also be less. Although the State Parks agreement would not occur, open space accounted for under the Project would remain. Therefore, Alternative 1 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the Alternative 1 site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of Alternative 1, the existing drainage patterns within the area would generally be preserved. Construction activities associated with Alternative 1 would not substantially alter the existing drainage pattern of the site in ways that would result in substantial erosion, siltation, or flooding on or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated Alternative 1, including site clearance, grading, and excavation, could create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. The extent of the stormwater drainage system replacement proposed under Alternative 1 would not be extensive as under the Project; therefore, Alternative 1 would be expected to result in less extensive site disturbance. Potential impacts associated with violation of water quality standards would be addressed through mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR, requiring preparation of a SWPPP and implementation of stormwater BMPs, and would reduce this impact to a less-than-significant level, similar to the Project.

Operation of Alternative 1 could contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. New development would have the potential to degrade the quality of surface receiving waters through the introduction of new impervious surfaces that contribute to stormwater runoff volumes and from the mobilization of pollutants in stormwater that would be generated by the proposed land uses. The potential for degradation of water quality due to this development would be reduced to a less-than-significant level with the incorporation of mitigation from the Hunters Point Shipyard Final EIR, requiring preparation of a Stormwater and Erosion Control Plan. As the extent of impervious surfaces would be reduced compared to the Project, impacts would be less than the Project.

Alternative 1 would reduce wastewater flows into the Combined Sewer System compared to the Project. Stormwater and wastewater from the Candlestick Point site would continue to discharge into the Combined Sewer System, as no separated system would be constructed at Candlestick Point. Therefore, overall flows from the site during wet weather could increase, because it is unknown whether the reduction in stormwater from a separate system at HPS Phase II under Alternative 1 would completely offset the stormwater from Candlestick Point that would continue to enter the Combined Sewer System. If the volume of stormwater from Candlestick Point plus the additional wastewater generated by development at Hunters Point Shipyard exceeds the stormwater diverted from the HPS Phase II site after development (compared to existing conditions), this potential increase in wet-weather flows would increase the potential for discharge from the combined sewage outfalls, which could increase potential impacts to receiving waters, a greater impact than the less-than-significant impact identified for the Project. To reduce adverse effects to water quality in the Bay from the discharge of stormwater runoff and wastewater to the combined system, Alternative 1 would include implementation of mitigation measures from the Hunters Point Shipyard EIR. However, it is uncertain whether this mitigation would offset the existing stormwater flows from Candlestick Point such that there would be no net increase in wet-weather flows. Thus, potential impacts related to violations of water quality standards or waste discharge requirements could be significant with Alternative 1, and greater than the less-than-significant impact identified for the Project.

As discussed above, implementation of Alternative 1 would not substantially deplete groundwater supplies. Development under Alternative 1 would also not utilize groundwater as a source of water supply. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and this impact would be less than significant, similar to the Project.

Operation of Alternative 1 would not alter the course of a stream or river, as none exists at or near the site currently. Additionally, operation of Alternative 1 would not alter the existing drainage pattern of the site in ways that would result in substantial erosion, siltation, or flooding on or off site. Implementation of the Alternative 1 would not contribute runoff water that would exceed the capacity of existing or planned

storm sewer systems or provide substantial additional sources of polluted runoff as the existing stormwater system would accommodate runoff flows and treat runoff prior to discharge to the Bay. Implementation of mitigation measures from the Hunters Point Shipyard EIR, requiring design of stormwater improvements to control CSO volumes, would reduce all impacts to a less-than-significant level.

The Project site is located within a special flood hazard zone (Zone A), as mapped on the Preliminary Flood Insurance Rate Map (FIRM). Implementation of Alternative 1 would include the placement of housing and other structures within the proposed 100-year flood zone that could impede or redirect flows. Because the Hunters Point Shipyard EIR did not include mitigation addressing this issue, the flood-related impacts of Alternative 1 would be significant, especially considering projected future sea level rise. In comparison to the Project, which includes mitigation to reduce this impact to a less-than-significant level, the impact associated with Alternative 1 would be more severe and potentially significant.

The Project site is adjacent to, but not within, dam failure inundation zones. Thus, implementation of the Alternative 1 would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Furthermore, based on historical records and the location of development, the placement of residential development would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

Compared to the Project, implementation of Alternative 1 would result in fewer impacts to biological resources because no development would occur at Candlestick Point. Furthermore, impacts related to construction of the Yosemite Slough bridge, shoreline improvements, and marina would be avoided because no such improvements are included in the HPS Redevelopment Plan. Similar to the Project, development under Alternative 1 could result in increased strike hazards to the new buildings along the shoreline of HPS Phase II. However, the development intensity would be substantially less and would not include any structures greater than 65 feet in height. Therefore, adverse operational effects to migratory birds would be less than with the Project. Development under Alternative 1 would not conflict with any local policies or ordinances protecting biological resources, similar to the Project. Impacts would be less than significant.

Public Services

Police Protection

Construction activities associated with implementation of Alternative 1 could result in obstruction of emergency access. The Project includes mitigation that would require the preparation of a Construction Traffic Management Plan (CTMP) to reduce this impact. However, no mitigation was included in the Hunters Point Shipyard Final EIR to ensure maintenance of adequate emergency access at all times. The City permitting process would likely address construction staging and emergency site access during the construction period, but this is not assured. Without mitigation or a process to ensure emergency access at all times on the site, construction activities under Alternative 1 also could provide increased opportunity for criminal activity and increase demand for police services. This could be a potentially significant impact that would not occur under the Project.

Implementation of Alternative 1 would result in a smaller increase resident and employee population at the Project site because of the smaller amount of development compared to the Project. Alternative 1 would require an increase in police services (15 new officers) to provide a comparable level of service to existing conditions.[1346] The San Francisco Police Department (SFPD) evaluates the need for additional officers by sector, and not station or district needs. While it is unlikely that 15 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City could be warranted by development of Alternative 1. This impact would be less than significant, the same as for the Project, although somewhat less because of the smaller amount of development.

Under this Alternative, land would not be dedicated for community-serving uses. If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility would have to be constructed at an off-site location. Construction of a new SFPD facility (counter, storefront, or other configuration) within the community services uses on the Project site and/or the reconfiguration or expansion of the existing Bayview Station would be funded by either the SFPD or the Project Applicant.

The cost for additional police officers and on-going operational costs would be funded through property taxes collected from future owners of on-site properties. Development of this Alternative would not require new or physically altered police facilities beyond the scope of the Project to maintain acceptable police services. Therefore, for development under Alternative 1, this impact is considered less than significant, the same as for the Project.

Fire and Emergency Medical Services

No mitigation measure was included in the Hunters Point Shipyard Final EIR to ensure maintenance of continued emergency access during construction activities. Without mitigation to ensure adequacy of emergency site access during construction, there could be a new impact to fire protection and emergency medical services under Alternative 1 compared to the Project. While the City permitting process would likely address construction staging and emergency site access during the construction period, this is not assured, and, without mitigation or a process that would ensure emergency site access, this could result in a potentially significant impact that would not occur under the Project. Alternative 1 would include additional residential units and substantially increase employment-generating uses compared to existing conditions, resulting in an employment population of 6,200. The increase in the residential and daytime employment population (for a total population of 10,394, including a residential population of 4,194 (combined Phase I and Phase II) plus 6,200 employees), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services, potentially resulting in the need to construct new facilities. This demand would be less than with the Project because of the lower amount of development under Alternative 1.

If needed, additional firefighters and ongoing fire protection operations would be funded through property taxes collected from future owners of on-site properties, allowing the San Francisco Fire Department (SFFD) to maintain acceptable response times for fire protection and emergency medical services. Under

[1346] The number of required police officers needed to meet comparable levels of service to existing conditions was determined using the total daytime population of Alternative 1 (residential population of 17,126 plus 7,578 employees) and the ratio of officers to population presented in Table II.O-2 (1:665 officer to population).

this alternative, land would not be dedicated for community-serving uses. Similar to the Project, prior to construction of new land uses at HPS Phase II, review of access strategies would be required pursuant to the SFFD's plan review requirements.[1347] However, because the stadium would not be constructed at HPS Phase II, consideration of game-day access would not be necessary. Compliance with all applicable provisions of the *San Francisco Fire Code*, in addition to the considerations discussed above, would ensure that this impact is less than significant for development under Alternative 1, the same as for the Project, although somewhat less because of the smaller amount of development.

Schools

Compared to the Project, the number of school-age children who would live within the Project site following full build-out of Alternative 1 would be substantially reduced. While schools in the Project vicinity have approximately 49 percent capacity remaining in the 2008-2009 school year, it is projected that a 12 percent overcapacity of San Francisco Unified School District (SFUSD) as a result of citywide population growth by 2030 would occur. Similar to the Project, the payment of school impact fees pursuant to SB50 would be considered full mitigation for potential school impacts. This impact is considered less than significant for development under Alternative 1, the same as for the Project.

Libraries

Construction of Alternative 1 would not result in impacts to the San Francisco Public Library (SFPL) system. Library branches are not currently located on the Project site. All library services would be available to the community throughout the duration of construction. As such, no impact to library services during construction of Alternative 1 would occur.

Residential and nonresidential development associated with Alternative 1 would increase demand for local library services in the Bayview neighborhood. Although this Alternative would result in a direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the Portola, Visitacion Valley, and the Bayview branches, would continue to meet the demands of the community. Unlike the Project, this alternative would not include space dedicated to library services to supplement the Bayview branch library. The SFPL branches would be required to accommodate increased demand from development under this Alternative. It is not anticipated that new or physically altered library facilities would be required in order to maintain acceptable service ratios; therefore, this impact is considered less than significant for development under Alternative 1. On balance, the impact would be substantially similar to the impact under the Project.

Recreation

Implementation of Alternative 1 would not include a State Parks land agreement or development of new parks at Candlestick Point. Compared to the Project, the CPSRA would remain 120.2 acres, compared to the 23.5-acre reduction under the Project. Neighborhood parks would be constructed at HPS Phase II consistent with the HPS Redevelopment Plan and Hunters Point Shipyard D4D. However, the amount of open space at HPS Phase II would be less than with the Project. Construction impacts associated with

[1347] San Francisco Fire Department, Plan Check website. http://www.sfgov.org/site/sffd_page.asp?id=57395 (accessed August 2009).

development of new parks and recreational facilities under the Project would be less than significant. Construction impacts for the development of parks under Alternative 1 would be similar to the construction impacts for the Project, and would essentially be the same impacts as discussed in Chapter III (Environmental Setting, Impacts, and Mitigation Measures) of this EIR.

At build-out of Alternative 1, the projected population within the Project site would consist of 4,194 new residents and approximately 6,200 new jobs. Compared to the Project, the CPSRA would remain 120.2 acres, compared to the 23.5-acre reduction under the Project. The total area of neighborhood parks would be reduced compared to the Project because parks would not be built at Candlestick Point. The amount of open space at HPS Phase II would also be less than the Project. The increase in population and employment could result in an increase in the use of existing parks, recreational facilities, and open space. Without a State Parks land agreement, there would be no established funding mechanism for future maintenance of the State Parks on site from the Project Applicant. Increased use of the CPSRA as a result of population and employment growth associated with Alternative 1 could result in deterioration of CPSRA facilities. This could result in a substantial adverse impact on recreational facilities at the Project site that would not occur under the Project. Without an established funding mechanism to address the increased use, improvements and maintenance of the CPSRA would be the responsibility of CDPR. Therefore, development of Alternative 1 could result in a new adverse impact on recreational facilities not identified for the Project.

In addition, Alternative 1 would not provide the substantial CPSRA improvements that would occur under the Project. These improvements, which are described at length in Section III.P (Recreation), include revegetation and landscaping, shoreline restoration and stabilization, infrastructure improvements (such as trails, pathways, and visitor facilities), the provision of habitat and opportunities for environmental education, "Eco-Gardens," and salt-marsh restoration. These improvements would turn portions of the Park that are used for Candlestick Park stadium parking or are undeveloped and underutilized into vibrant parts of the CPSRA and of the Project's overall network of parks. Currently improved parts of the CPSRA, such as The Heart of the Park, The Point, The Neck, and The Last Port, would also be improved. Overall, the reconfiguration and improvements would enhance park aesthetics and landscape ecology, provide connections throughout the CPSRA and the other Project parks, and provide direct access to the Bay and the Bay shoreline for walking, swimming, fishing, kayaking, and windsurfing. None of these improvements would occur under Alternative 1.

Alternative 1 would not alter the windsurfing launch site at CPSRA. Since the height of structures would be limited to 65 feet under Alternative 1, large volumes of wind are not likely to be intercepted by development under Alternative 1. No impact on windsurfing would occur under Alternative 1.

Utilities

Water Supply

Construction activities associated with this alternative, including installation of new water service utility infrastructure, would be required to implement mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR, along with compliance with applicable federal, state, and local regulations. The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with this alternative.

This alternative would generate less demand for water compared to the Project. Utilizing a demand methodology similar to the Project, Alternative 1 would require approximately 0.58 million gallons per day (mgd) (including Phase I), less than the 1.37 mgd of net demand required by the Project.[1348] As stated in the Water Supply Assessment prepared for the Project, the San Francisco Public Utilities Commission (SFPUC) indicates that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions (refer to Appendix Q1 [Water Supply Assessment]). Therefore, there would be sufficient water supplies to accommodate the water demand of Alternative 1, as it includes less development than under the Project. In addition, a mitigation measure adopted with certification of the Hunters Point Shipyard Final EIR would require improvements to the drinking water supply system to ensure safe potable water and adequate water pressure. Similar to the Project, implementation of Alternative 1 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant.

The Hunters Point Shipyard Final EIR determined that the existing water system has insufficient pressure for adequate fire protection in certain portions of the Project site. Alternative 1 would be required to implement a mitigation measure adopted with certification of the Hunters Point Shipyard Final EIR that requires construction of a new auxiliary water supply system to augment the water supply for firefighting purposes. The AWSS would ensure the provision of adequate water for on-site firefighting purposes, and Alternative 1 would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact would be less than significant, the same as for the Project.

Wastewater

Construction activities associated with this alternative, including installation of new wastewater treatment or collection facilities or expansion of existing facilities, would be required to implement mitigation measures adopted with certification of the Hunters Point Shipyard Final EIR, along with compliance with applicable federal, State, and local regulations.

Development under Alternative 1 would only occur at the HPS Phase II site. Wastewater from the HPS Phase II site flows into the Hunters Point tunnel sewer. The analysis in Section III.Q (Utilities) determined that wastewater generated by development under the Project would be accommodated within the remaining capacity of the Hunters Point tunnel sewer. Because water demand would be less for Alternative 1 than the Project, wastewater generation would also be less. Therefore, the sewer would have sufficient capacity to accommodate development under Alternative 1, as analyzed for the Project, and the impact would be less than significant. In addition, a mitigation measure adopted with certification of the Hunters Point Shipyard Final EIR would require that a sanitary collection system would be constructed to meet the collection needs of the development.

This alternative would not exceed wastewater treatment requirements of the applicable RWQCB, compliance with which is otherwise required by law. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that Alternative 1 would not exceed the applicable wastewater treatment requirements of the RWQCB. This impact would be less than significant, the same as for the Project.

[1348] Water demand for this alternative was estimated by prorating water demand for the Project (presented in Table III.Q-4) based on build-out of Alternative 1.

Solid Waste

As shown in Table III.Q-7 (Estimated Demolition Debris), it is estimated that under the Project at HPS Phase II, approximately 477,823 tons of construction waste would be produced during building demolition and approximately 69,281 tons of construction waste would be produced during road demolition. A total of approximately 547,104 tons of construction waste would be produced during building and road demolition over the build-out period for HPS under Alternative 1, compared to 971,785 tons of construction waste under the Project. Construction waste would be substantially reduced because no demolition or construction would occur at Candlestick Point. Some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. Alternative 1 would be subject to the City's Green Building Ordinance, which requires the diversion of at least 75 percent of construction waste. Therefore, the impact of the construction waste generated by the Alternative 1 on the capacity of the Altamont Landfill would be less than significant, and less than the Project because the total amount of construction waste would be less.

Construction activities at HPS Phase II, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a Treatment, Storage, and Disposal facility (TSD) authorized to treat such hazardous waste. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes. Because TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of HPS Phase II would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact, and less than the Project, as the total amount of hazardous waste would be less.

At full build-out, Alternative 1 would generate approximately 6,525 tons of municipal solid waste annually when all uses are fully operational and assuming no waste-reduction measures. This would represent approximately 1.1 percent of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons).[1349] All residents and businesses of the Project would be required to comply with the City's mandatory recycling and composting ordinance. Municipal solid waste remaining after sorting is currently transported to the Altamont Landfill in Livermore. The Altamont Landfill is scheduled to close in January 2029, concurrent with full build-out of the Project, and the City's existing contract with Altamont Landfill expires in 2014, likely before build-out of the Alternative. Three landfills have been identified as candidates to accommodate the City's solid waste needs after the contract with Altamont Landfill expires. The process of selection and negotiation of a new contract is anticipated to be completed by early 2010. The impact of operational solid waste generated by Alternative 1 on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant. Because the total amount of solid waste that would be generated by Alternative 1 would be less than under the Project, the impact would also be less.

[1349] Solid waste generation for this alternative was estimated using the solid waste generation rates presented in Table III.Q-8.

Specific businesses or activities that could operate under Alternative 1 are not known at this time. However, nearly all uses would involve the routine use of hazardous materials at varying levels that would require disposal. It is assumed that a variety of hazardous materials could be used in small quantities, ranging from R&D in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios, and the marina, where small quantities of fuel could be utilized. In addition, the HPS Redevelopment Plan allows maritime industrial uses, which could store and use greater quantities of hazardous materials. Since there is no established ceiling on capacities of TSDs in California and adjoining states, it is assumed there would be sufficient capacity to accommodate all anticipated hazardous wastes from such uses. New residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Hazardous waste that would be generated by the Project could be accommodated by existing facilities, and this impact would be less than significant. Because the total amount of hazardous waste would be less than under the Project, the impact would also be less with Alternative 1.

As with all projects, this alternative would comply with all applicable federal, state, and local statutes and regulations related to solid waste. Compliance with the identified project requirement would ensure that this impact would be less than significant, the same as for the Project.

Electricity, Natural Gas, and Telecommunications

The HPS Phase II site is currently served by PG&E for electricity and natural gas and by Pacific Bell for telecommunications. Development of Hunters Point Shipyard would be subject to any mitigation measures included in the Hunters Point Shipyard Final EIR, which would reduce construction impacts from any needed infrastructure improvements to less than significant. Any subdivision process would include submittal of detailed infrastructure plans to the Department of Public Works identifying how infrastructure needs of new development would be met. Implementation of these plans would be a condition of subdivision approval. The subdivision process would ensure that adequate infrastructure is provided to accommodate the demands of development such that the capacity of the service providers to provide such utilities would not be exceeded. Therefore, the impact would be less than significant for Alternative 1, similar to the Project

Energy

Construction activities associated with implementation of Alternative 1 would require energy sources including electricity, diesel, and gasoline. Construction activities would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy and would be subject to requirements to minimize wasteful fuel consumption. Alternative 1 would include a much smaller development program compared to the Project because development would occur at the HPS Phase II site only, and, therefore, the energy use during the construction period of Alternative 1 would be substantially less than the Project. Therefore, construction-related energy use associated with development under Alternative 1 would be less than significant, even less than the Project.

Implementation of Alternative 1 would result in baseline electricity and natural gas consumption substantially less than the Project, primarily because the development program would be reduced. Similar

to the Project, development of Alternative 1 would be subject to the requirements of Title 24 and would be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. However, development under Alternative 1 would not be required to include additional efficiency measures as proposed under the Project. Nonetheless, energy consumption at the HPS Phase II site under development of Alternative 1 would be in compliance with existing energy-efficiency standards, which would ensure that energy use is efficient and not wasteful. Therefore, energy impacts would be less than significant under development of Alternative 1, but greater than under the Project.

Alternative 1 would increase trips to and from the HPS Phase II site, thereby increasing the use of petroleum fuels. However, new trips would be substantially less than the Project because the overall development program would be substantially reduced. For development of Alternative 1, mitigation measures adopted with certification of the Final EIR for the Hunters Point Shipyard Final EIR would require implementation of a TDM program, similar to the Project. The TDM measures would be implemented to reduce automobile and light truck vehicle miles traveled and encourage residents, employees, and visitors to use alternative modes of travel, such as transit, walking, and bicycling. In addition, the TDM plan would include measures to reduce the demand for travel during peak times. With implementation of TDM measures, Alternative 1 would not be wasteful with respect to petroleum fuel consumption, and impacts would be less than significant.

Greenhouse Gas Emissions

Similar to the Project, construction activities associated with implementation of Alternative 1 would emit GHGs associated with diesel and gasoline consumption. Construction activities would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not be a prolonged source of GHG emissions. Alternative 1 would include a much smaller development program compared to the Project because development would occur at the HPS Phase II site only, and, therefore, the GHG emissions during the construction period of Alternative 1 would be substantially less than the Project. Therefore, construction-related GHG emissions and climate change associated with development under Alternative 1 would be less than significant, even less than the Project.

Implementation of Alternative 1 would result in operational GHG emissions substantially less than the Project, primarily because the development program would be reduced. Similar to the Project, development of Alternative 1 would be subject to the requirements of Title 24 and would be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Alternative 1 would increase trips to and from the HPS Phase II site, thereby increasing the use of petroleum fuels. However, new trips would be substantially less than the Project because the overall development program would be substantially reduced. For development of Alternative 1, mitigation measures adopted with certification of the Final EIR for the Hunters Point Shipyard would require implementation of a TDM program, similar to the Project. The TDM measures would be implemented to reduce automobile and light truck vehicle miles travelled and encourage residents, employees, and visitors to use alternative modes of travel, such as transit, walking, and bicycling. In addition, the TDM plan would include measures to reduce the demand for travel during peak times. In addition, similar to the Project, Alternative 1 would also be subject to the vehicle efficiency regulations and renewable portfolio standards that would reduce the GHG emissions associated with vehicles and electricity use. However, development under Alternative 1 would not include a requirement to include additional efficiency measures as proposed under the Project. In addition the development would not result

in the same reductions in trips as are associated with a larger and denser development with more local jobs. Nonetheless, GHG emissions at the HPS Phase II site under development of Alternative 1 would be in compliance with existing energy efficiency standards, vehicle efficiency measures, and renewable energy portfolio standards which would ensure that there are some reductions in GHG emissions. Therefore, GHG emissions and climate change impacts would be less than significant under development of Alternative 1.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2nd. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for the No Project Alternative and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change. While the No Project Alternative would include less development, it would not include the density and job creation attributes of the Project, thus the No Project Alternative would decrease the housing density, alter the service population, and not include implementation of energy efficiency measures which would impact the amount of GHG emissions per service population. Without a quantitative analysis, the comparison to the BAAQMD threshold cannot be judged, and it may not be below the threshold.

Attainment of Project Objectives

Implementation of the No Project Alternative would not meet most of the Project objectives, as no new uses would be constructed at Candlestick Point and development at HPS Phase II would proceed under land use plans and controls adopted as part of the 1997 HPS Redevelopment Plan. Because development would occur at HPS Phase II, some of the Project objectives could be met, but not to the same extent as the Project. Objectives would be partially met by development at HPS Phase II because Alternative 1 would: create public open space; create jobs and economic development; create permanent space for artists; provide neighborhood-serving retail; develop affordable housing; and transform contaminated portions of the shipyard into economically productive uses or public open space. Many objectives would not be met by the No Project Alternative because it would not include: improvements to CPSRA and development of new public open space uses at Candlestick Point; extension of the Bay Trail along the waterfront; development

of a new stadium for the San Francisco 49ers; redevelopment of the Alice Griffith Public Housing site; or creation of connections between Candlestick Point, HPS, and the larger Bayview neighborhood.

Refer to Table VI-3 (Attainment of Project Objectives—Alternative 1) below for a discussion of whether or not the Alternative achieves each objective.

Table VI-3 Attainment of Project Objectives Alternative 1

Objective	*Meets Project Objective?*	*Analysis*
1. The integrated development should produce tangible community benefits for the Bayview and the City.	Y–	Alternative 1 would include some community benefits because development would occur at HPS Phase II. However, compared to the Project, Alternative 1 would include substantially less economic development, affordable housing, parks and open space amenities, and improved connection to the existing Bayview neighborhood. Therefore, Alternative 1 would meet this objective to a lesser extent than the Project.
2. The integrated development should re-connect Candlestick Point and the Hunters Point Shipyard site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents.	Y–	Alternative 1 would include a mix of uses and urban design concepts that would provide a direct physical, visual, and architectural connection to the Bayview neighborhood and City. However, development would only occur at HPS Phase II. Alternative 1 would not provide automobile, public transportation, and pedestrian connections between HPS Phase II and Candlestick Point. Connections to the Bayview neighborhood would be substantially reduced compared to the Project. Therefore, Alternative 1 would meet this objective to a lesser extent than the Project.
3. The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourages the rebuilding of Alice Griffith Public Housing.	N	Alternative 1 would include a substantially reduced amount of affordable housing and would not rebuild the Alice Griffith Public Housing site. Alternative 1 would not meet this Project objective.
4. The integrated development should incorporate environmental sustainability concepts and practices.	Y–	Alternative 1 would be required to meet the sustainability requirements of the City and State with regard to design of public open spaces, recreation facilities, and infrastructure including wastewater, storm water, utility, and transportation systems. Alternative 1 would not include the additional energy-efficiency measures proposed under the Project. Therefore, Alternative 1 would meet this objective to a lesser extent than the Project.
5. The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure.	N	Alternative 1 would not include construction of a new stadium and would not meet this Project objective.
6. The integrated development should be fiscally prudent, with or without a new stadium.	Y–	Development of Alternative 1 would increase sales tax revenue to the City and would encourage substantial private capital investment at the HPS Phase II site. However, the amount of sales tax generating use and potential private investment would be substantially less than the Project and would meet this objective to a lesser extent than the Project.

Y = Alternative <u>does</u> meet Project objective.
Y- = Alternative meets Project objective, but to a lesser extent than the Project.
Y– = Alternative meets Project objective, but to a significantly lesser extent than the Project.
N = Alternative <u>does not</u> meet Project objective.

VI.C.2 Alternative 2: CP-HPS Phase II Development Plan; No Yosemite Slough Bridge

Summarized Description

Alternative 2 would have the same land use program as the Project as presented in Project Description, Table II-3 (Proposed Land Use), except that the Yosemite Slough bridge would not be constructed. The agreement between the CDPR and the City or the Agency to reconfigure the boundaries of CPSRA, provide park improvements, and provide an ongoing source of funding for park operation and maintenance (referred to as State Parks agreement) would take place as proposed under the Project. This alternative would include a stadium at HPS Phase II.

Detailed Description

Candlestick Point

The development program at Candlestick Point under Alternative 2 would be the same as for the Project, including, residential, retail, office, community services, hotel, arena, and parks and open space. The Yosemite Slough bridge would not be constructed.

HPS Phase II

The development program at HPS Phase II under Alternative 2 would be the same as under the Project, including the stadium, residential, retail, R&D, artists' studios, community services, marina, and parks and open space.

Transportation and Circulation System (without Yosemite Slough Bridge)

- Under Alternative 2, transit and non-motorized traffic would be required to circumnavigate Yosemite Slough because no bridge would be constructed. On game days, motorized and non-motorized traffic, which would travel across Yosemite Slough Bridge under the Project, would also be required to circumnavigate Yosemite Slough because no bridge would be constructed under Alternative 2. Figure VI-1 (Alternative 2 Circulation Plan Railroad Right-of-Way for Bus Rapid Transit) illustrates the proposed route. The rest of the street network at Candlestick Point and HPS Phase II would be the same as the Project.

- Similar to the Project, under Alternative 2, the primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas Avenue to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.



Existing RR ROW

BRT Path: Using RR ROW for portion of route around Slough

Auto Route Alignment

0 500

Feet

SOURCE: SFMTA, 2010.

PBS&J 04.09.10 02056 | JCS | 10

FIGURE VI-1

Candlestick Point — Hunters Point Shipyard Phase II EIR

ALTERNATIVE 2 CIRCULATION PLAN RAILROAD RIGHT-OF-WAY FOR BUS RAPID TRANSIT

Between the intersection of Carroll Avenue/Arelious Walker Drive and Crisp Road within HPS Phase II, the proposed BRT line would be routed on Carroll Avenue between Arelious Walker Drive and Hawes Street; on Hawes Street between Carroll Avenue and Armstrong Avenue (currently unimproved); and on Armstrong Avenue between Hawes Street and the Navy rail right-of-way; along the Navy rail right-of-way between Armstrong Avenue and Shafter Avenue; along Shafter Avenue between the Navy rail right-of-way and Arelious Walker Drive; and on Arelious Walker Drive between Shafter Avenue and Crisp Road (currently unimproved).

On Carroll Avenue, Hawes Street, and Armstrong Avenue to the Navy rail right-of-way, the Bus Rapid Transit (BRT) line would operate within an exclusive BRT lane and one of the two travel lanes in each direction would be transit-only. Hawes Avenue between Carroll Avenue and Armstrong Avenue and Arelious Walker Drive between Shafter Avenue and Crisp Road are currently unimproved streets and would be built out to accommodate one transit-only travel lane in each direction. The Navy rail right-of-way between Armstrong Avenue and Shafter Avenue would be improved to provide one transit-only travel lane in each direction. Shafter Avenue between the Navy rail right-of-way and Arelious Walker Drive would be reconfigured to provide four travel lanes, with BRT operating in dedicated center lanes.

Basis for Impact Analysis

For the Project, the potential impacts are generally based on the parameters of the Project, which include the size, bulk, and type of development, the footprint of development, and the number of residents, employees, and visitors to the Project site. For Alternative 2, the impacts of the Project are compared to the impacts of the same development program and parameters of the Project, except Alternative 2 would not include construction of the Yosemite Slough bridge and approach streets. The total square footage of all uses would be the same as the Project, including a new stadium at HPS Phase II.

Potential Impacts

Land Use and Plans

Implementation of Alternative 2 would require amendments similar to the Project for the following planning documents: *City of San Francisco General Plan*; *Bayview Hunters Point Redevelopment Plan*; *Hunters Point Shipyard Redevelopment Plan*; *San Francisco Bay Plan (Bay Plan); San Francisco Bay Area Seaport Plan*; and *CPSRA General Plan*. However, with implementation of the requirements and mitigation measures identified for the Project in Section III.C through Section III.S of this EIR, development under Alternative 2 would not conflict with any applicable land use plans, policies, or regulations (of an agency with jurisdiction) adopted for the purpose of avoiding or mitigating an environmental effect. Furthermore, development under this Alternative would not conflict with any of the policies, goals, and strategies analyzed for the Project. Although the Project is consistent with the Bay Plan polices with regard to Bay fill, it should be noted that development under Alternative 2 would reduce the amount of Bay fill compared to the Project, because the Yosemite Slough bridge would not be constructed. Similar to the Project, this impact would be less than significant.

Implementation of Alternative 2 would not result in a substantial adverse change in the existing land use character of the site. Without the Yosemite Slough bridge, the BRT would be routed partially along local streets and partially within the Navy right-of-way. This would change the land use character of the areas

along the BRT route, but would not be considered an adverse change, as simply adding rapid buses to the area would not materially affect land use character. Development under Alternative 2 would substantially change the character of the site from open space and industrial uses to an urbanized area representative of other areas in San Francisco. This change would improve deteriorated conditions and connectivity, as well as provide numerous areas of open space, extensive landscaped areas, pleasing architecture, and shoreline improvements, all of which would improve the character of the site. Therefore, changes resulting from development under Alternative 2 would not be considered adverse. Furthermore, the transition in scale between adjacent neighborhoods and development under this Alternative, as well as the varied range of proposed uses, would ensure that the change in the land use character is not adverse. Similar to the Project, this impact would be less than significant.

Population, Housing, and Employment

Construction activities associated with implementation of Alternative 2 would induce direct job growth at the site. The number of construction workers that would be employed during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge would not occur. It is anticipated that construction employees would commute from elsewhere in the region, rather than relocate to the Bayview Hunters Point neighborhood for a temporary construction assignment. Thus, construction under this Alternative would not generate a substantial, unplanned population increase. Direct and indirect impacts associated with construction employment would be less than significant, the same as for the Project.

Implementation of Alternative 2 would induce direct and indirect population growth, but this growth would not be considered substantial. Similar to the Project, development under this Alternative would result in 7,850 housing units at Candlestick Point and 2,650 units at HPS Phase II, for a total of 10,500 new housing units at the Project site. Employment growth generated by development under this Alternative would result in the demand for 8,263 new housing units, which would be less than the total number of new housing units (10,500) that would be provided. The jobs and housing units that would be provided at the site would be closely balanced (approximately 10,730 jobs and 10,500 housing units) so that neither a surplus of housing nor jobs would occur that could result in indirect residential or employment growth. As a result, similar to the Project, the population and employment increase associated with development under Alternative 2 would not be substantial. This impact is considered less than significant, the same as for the Project.

Transportation and Circulation

Alternative 2 would be the same as the Project, except it would not include the Yosemite Slough bridge. Because vehicular traffic could not use the bridge on non-game days, the main roadway connection between Candlestick Point and HPS Phase II would be the same as with the Project, via Ingalls Street. The bus rapid transit (BRT) route would be along Carroll Avenue, Hawes Street, Armstrong Avenue, and the abandoned railroad right-of-way to provide access between Candlestick Point and HPS Phase II. Alternative 2 would otherwise have the same transportation improvements as proposed with the Project.

Generally, travel demand associated with all Variants and Alternatives studied would be similar with or without the Yosemite Slough bridge. Because the Yosemite Slough bridge would not accommodate auto travel on non-game days, the traffic circulation patterns are expected to be the same under Alternative 2

as the Project. Similarly, since auto traffic would only use the bridge on game days for any Alternative or Variant considered, the typical non-game day travel patterns for any of the Alternatives or Variants that include the bridge would be the same under conditions without the bridge.

Without the bridge across Yosemite Slough, the proposed new BRT route traveling between Balboa Park BART Station and the Hunters Point Shipyard Transit Center would follow a different alignment than under the Project. Instead of a direct route across Yosemite Slough, the BRT route would travel west along Carroll Avenue, north along Hawes Street, and then west on Armstrong Avenue, where it would join the Navy railroad right-of-way. The BRT route would travel in the railroad right-of-way around Yosemite Slough, rejoining the existing roadway network at Shafter Avenue. The route would continue east on Shafter Avenue to Arelious Walker, where it would reassume the same alignment as the Project.

This additional travel distance and travel time would have a notable effect on passengers who use the BRT to travel to or from the Hunters Point Shipyard (the analysis indicates a reduction of 15 percent for these trips). However, because this represents a relatively small portion of overall Project-generated transit riders, the overall change in transit ridership and auto trip generation is negligible. This conclusion applies to any Variant or Alternative that was analyzed assuming a bridge over Yosemite Slough.

Operation of the BRT within the rail right-of-way would not affect study intersection operations. Therefore, the traffic impacts associated with Alternative 2 would be the same as the Project. Similarly, traffic impacts associated with any Variant or Alternative that was analyzed assuming a bridge over Yosemite Slough would be the same as the equivalent Variant or Alternative without the bridge.

The Transportation Study analyzed Alternative 2 and conclusions from the Transportation Study are presented below.

Construction Impacts

Construction activities associated with Alternative 2 would be similar to effects with the Project. Localized construction-related traffic impacts would therefore remain significant and unavoidable.

Intersection Conditions

Alternative 2 would have similar project and cumulative effects at study intersections. The Yosemite Slough bridge would not serve vehicle traffic on game days at the football stadium; weekday conditions would be the same as with the Project. Section III.D discusses traffic effects at those intersections, and the feasibility of mitigation measures. In general, intersection conditions would be significant and unavoidable effects of Alternative 2.

During game days at the football stadium, with no Yosemite Slough Bridge, the entrance and exiting capacity for vehicles would be reduced about 40 percent compared to the Project; four out of a total 11 exit lanes would be available without the bridge. As with the Project, a mitigation measure to implement a Travel Demand Management Plan for the stadium events would reduce but not avoid traffic impacts, which would be significant and unavoidable.

Freeway Conditions

Alternative 2 freeway mainline sections effects, freeway ramp junction conditions, and ramp queuing effects would be similar to Project conditions, with significant and unavoidable impacts.

Transit Impacts

Alternative 2 transit conditions assume implementation of Project-related transit improvements. Alternative 2 would have a less than significant impact on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with Alternative 2 would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. As concluded in Section III.D, the transit delay effects would remain significant and unavoidable. During the AM and PM peak hour, Alternative 2 would require up to 28 additional vehicles, the same as with the Project.

Although the alternative BRT route around Yosemite Slough would be technically feasible, it would not be an optimal configuration for a BRT system. BRT service would provide direct, fast, and reliable travel in a dedicated right-of-way, typically with signal priority for BRT vehicles. When these elements are combined, the BRT service takes on a higher quality character than typical local bus service. The Yosemite Slough bridge would provide a dedicated right-of-way and the most direct route between Hunters Point Shipyard and points to the west, including Candlestick Point, the Bayshore Caltrain Station, and Balboa Park BART. Although the route around Yosemite Slough proposed under Alternative 2 would provide exclusive right-of-way, the route would involve a number of right-angle turns and additional signalized intersections and would not provide a comparably direct route as that provided on the bridge proposed by the Project.

Bicycle Impacts

The Alternative 2 bicycle trips would be accommodated within the proposed street and network, although there would not be a Yosemite Slough bicycle and pedestrian route; impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The Alternative 2 pedestrian trips would be accommodated within the proposed sidewalk and pedestrian network, although there would no Yosemite Slough bicycle and pedestrian route; impacts on pedestrian circulation would be less than significant.

Parking Impacts

Alternative 2, with the same land use program and parking plans as the Project, would have the same parking effects as the Project. There would be a parking shortfall, but this impact would be considered less than significant.

This alternative would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

Construction activities associated with implementation of Alternative 2 would occur during the same 19-year build-out period and involve the same activities as the Project. Like the Project, those activities would be visible to surrounding land uses and could impact views of scenic vistas and scenic resources in the area. However, any impacts to views would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Mitigation for the Project would also be implemented with this alternative that would reduce visual construction impacts to less than significant. Therefore, impacts to scenic vistas during construction of Alternative 2 would be the same as under the Project, and less than significant. Construction activities associated with Alternative 2 would not result in adverse effects on any scenic vistas and the impact would be less than significant, the same as for the Project.

There are no scenic resources on the Project site that would be adversely affected by construction of Alternative 2. As with the Project, construction activities for Alternative 2 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates that would be visible during construction of the utility infrastructure improvements, especially where right-of-way improvements are required for the route around the slough. Although these activities would take place primarily on site, views of the activities could be available from surrounding land uses. As with the Project, implementation of the identified mitigation measure (MM AE-2) would require the Project developer of Alternative 2 to screen construction sites from public view at street level, provide for appropriate staging of construction equipment, and maintain the cleanliness of construction equipment. Therefore, construction activities under Alternative 2 would have a less-than-significant impact on the visual character or quality of the site, similar to the Project.

Construction of Alternative 2 would occur during daylight hours, and, therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass); however, similar to the Project, the glare created by construction activities at the Project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after hours on all construction sites, but this lighting would be minimal, restricted to the Project site, and would not exceed the level of existing night lighting levels in other urban areas of San Francisco. The overall construction period would remain essentially the same as under the Project. In addition, similar to the Project, construction lighting would comply with all City lighting requirements. Therefore, construction activities for development under Alternative 2 would have less-than-significant light and glare impacts.

As shown in Figures III.E-11 through Figure III.E-18 in Section III.E (Aesthetics), development under Alternative 2 would change views of the Project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. Alternative 2 would not introduce the new visual element of the bridge across Yosemite Slough, but the analysis for the Project determined that the bridge would not result in average long- or short-range views of the Bay or other scenic vistas. Development of Candlestick Point would not block publicly accessible views of the Bay or other scenic vistas. Views of the East Bay and the Bay from the Project site would be maintained within public access areas, as well as at City and State parks located within Candlestick Point. Similarly, development of HPS Phase II would not substantially block scenic vistas, including the Bay. Views of the East Bay and the Bay from HPS Phase II would be maintained on the site and within public access areas, such as from HPS Phase I Hilltop Park. While development of

Alternative 2 would include high-rise towers similar to the Project at Candlestick Point and HPS Phase II, those towers are not clustered and would not substantially obstruct views of the Bay or beyond from any long-range viewpoints. Therefore, similar to the Project, development under Alternative 2 would not substantially obstruct any scenic vistas, and this impact would be less than significant.

Alternative 2 would include the same development program as the Project, with the exception of the Yosemite Slough bridge. As shown by the various photographs and simulations in Section III.E, development under Alternative 2 would not substantially damage scenic resources that contribute to a scenic public setting. Alternative 2 would include replacing degraded urban areas and outdated residential development with new, well-designed urban development and integrated public parks. The Yosemite Slough bridge and roadway approaches would not be constructed and the appearance of the slough would be unchanged. Scenic resources at HPS Phase II would be retained, including the Re-gunning crane. Shoreline improvements at Candlestick Point and HPS Phase II would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 2 would not damage or remove any identified scenic resources that contribute to a scenic public setting and the impact would be less than significant.

As shown in Figures III.E-19 through Figure III.E-30, development of Alternative 2 would change the visual character of the Project site. However, similar to the Project, Alternative 2 would not substantially degrade the visual character or quality of the Project site area or its surroundings. In fact, development under Alternative 2 would improve the degraded and deteriorated condition of much of the Project site. Development under Alternative 2 would replace the existing conditions with a more dense urban setting, but this would not be considered an adverse change. The proposed shoreline improvements would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 2 would not substantially degrade the visual character or quality of the Project site or its surroundings. The impact would be less than significant.

Development under Alternative 2 would increase lighting on the Project site relative to existing outdoor lighting, and new building surfaces would increase the level of illumination in the area. Area lighting would illuminate larger areas that are well traveled so as to promote way finding and provide for a safe environment. In addition to area lighting, building lighting would be angled towards building surfaces for aesthetic purposes and/or to illuminate signs. Like the Project, both types of lighting would be designed to avoid direct visibility of the light source. City Resolution 9212 prohibits the use of highly reflective or mirrored glass in new construction. Implementation of the identified mitigation measures (MM AE-7a.1, MM AE-7a.2, MM AE-7a.3, and MM AE-7a.4) and compliance with City Resolution 9212 would reduce impacts from light and glare to a less-than-significant level by shielding lighting fixtures, minimizing spill light, screening vehicle headlights to the maximum extent feasible, and eliminating or minimizing increased glare by the use of non-reflective glass and non-reflective textured surfaces within the proposed development area.

The new San Francisco 49ers stadium on the HPS Phase II site would provide a source of illumination in a different location from the existing Candlestick Park stadium. Similar to the Project, implementation of the identified mitigation measures (MM AE-7b.1 and MM AE-7b.2) would ensure that the impact of stadium lighting would be less than significant. The stadium developer would be required to test the installed field-lighting system to ensure that lighting meets the operating requirements in the stadium and minimizes obtrusive spill lighting from the facility. The impact would be less than significant.

Shadows

Development under Alternative 2 would include the same heights, layouts, and orientations of buildings as the Project. At Candlestick Point, the existing public open space, Bayview Park and Gilman Park, would not be affected by new shading from development under Alternative 2. Gilman Park would experience some shading on winter afternoons. Those shadows would be cast by buildings that do not exceed 40 feet in height, are not subject to *Planning Code* Section 295, and, therefore, would not be considered an adverse impact. Some new shadows would be cast on Bayview Park; these would have a less-than-significant effect on that park. The CPSRA would be affected by new shade in the afternoon but most areas would experience limited to no new shadow from development under Alternative 2. At HPS Phase II, the existing public open space, India Basin Shoreline Park and India Basin Open Space, would not be affected by new shading from development under Alternative 2. New shadows cast by development under Alternative 2 on proposed new parks throughout the year would range from little or no shading to large areas of certain parks receiving new shade, particularly in the late afternoon during the vernal and autumnal equinoxes. The extent and duration of shadow on new public sidewalks would increase along street corridors of Alternative 2. Similar to the Project, this new shadow would not be in excess of that which would be expected in an urban area. New shade created by implementation of Alternative 2 would occur at limited times of the day and year, and would not substantially affect the use of outdoor recreational facilities or open space. Similar to the Project, this impact would be less than significant.

Wind

Development under Alternative 2 would include structures above 100 feet in height, ranging up to 420 feet, which would extend well above surrounding buildings and intercept a large volume of wind. Because of the exposure of the tall structures to wind, the tower structures would have the potential to accelerate winds in nearby pedestrian sidewalk areas or public open space areas. The degree of change in pedestrian-level wind conditions would be influenced by building design, such as building height, shape, massing, setbacks, and location of pedestrian areas. Structures nearing or over 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 miles per hour for a single hour of the year would be exceeded. Similar to the Project, the street grid of Alternative 2 would not align with predominant west and west-northwest wind directions and would, therefore, not result in channeling of winds along street corridors. The street grid would orient building faces such that they would not face into the prevailing wind direction; that orientation would reduce potentially significant pedestrian-level wind acceleration at the Project site.

Implementation of the identified mitigation measure (MM W-1a) would reduce the potential impact from wind for development of Alternative 2 by requiring review of all buildings that could result in adverse wind impacts by a qualified wind consultant. If the review identifies exceedance of the wind hazard criteria, the design must be revised to reduce the impact below the established threshold. Implementation of required design changes, if any, would reduce potential hazardous wind effects at the pedestrian level by forcing wind downwash to tops of podium areas and/or into the street and away from pedestrian areas. Compliance with the mitigation measures would ensure pedestrian safety in pedestrian-access areas. Similar to the Project, through implementation of the identified mitigation measure, wind impacts would be less than significant. Elimination of the bridge would not change any of the Project's potential wind impacts.

Air Quality

As the footprint of development, the total amount of development, and the land uses provided with Alternative 2 would be virtually the same as the Project, air quality impacts of Alternative 2 would also be the same as the Project.

Construction activities for Alternative 2 would generate dust; however, they would need to comply with the San Francisco Health Code and BAAQMD requirements. Implementation of MM HZ-15, which would require the Applicant to ensure that construction contractors comply with the dust control strategies included in an approved dust control plan as part of a site-specific dust control plan, would reduce the impacts caused by construction dust to a less-than-significant level. This impact would be the same as for the Project.

Construction activities could also create DPM; however, as the development of Alternative 2 would be substantially the same as the Project, implementation of mitigation measures MM AQ-2.1 and MM AQ-2.2, accelerated emission control implementation on construction equipment, would keep this impact less than significant. Construction activities could also generate TAC-containing PM_{10}; however, as construction activities for Alternative 2 would be substantially the same as for the Project, this impact would be less than significant.

Operational emissions associated with Alternative 2 would be the same as those of the Project, therefore the mass emissions would exceed the BAAQMD CEQA thresholds, and this impact would remain significant and unavoidable, similar to the Project. Alternative 2 has the same R&D square footage, therefore potential TAC emissions from facilities in R&D areas would be the same as the Project. With the implementation of mitigation measures MM AQ-6.1 and MM AQ-6.2, this impact would be less than significant and the same as for the Project.

Additionally, as the scale of Alternative 2 is the same as the Project, the impacts from Alternative 2 traffic (e.g., carbon monoxide and $PM_{2.5}$) would be the same as for Project and less than significant.

According to the current BAAQMD CEQA Guidelines, odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD regards as having potential to generate considerable odors include: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries, and chemical plants. Alternative 2 would be a large mixed-use development containing residential, office, retail, R&D, recreational, and entertainment uses. Although there may be some potential for small-scale, localized odor issues to emerge around proposed sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely and would be resolved by interventions after receipt of any complaints. This would be a less-than-significant impact, the same as for the Project.

The Project is consistent with regional air quality plans. Since Alternative 2 would have essentially the same footprint and generate the same amount of traffic, Alternative 2 would also be consistent with these plans. Alternative 2 promotes the use of alternative transportation modes, such as transit, biking and walking. In addition, it puts housing in close proximity with jobs and retail establishments, reducing the length of trips and further reducing reliance on single-occupancy vehicles. Therefore, Alternative 2 conforms to the regional air quality plan and there would be a less-than-significant impact, the same as for the Project.

Noise

As the footprint of development, the total amount of development, and the land uses provided with Alternative 2 would be the similar to the Project, noise impacts of Alternative 2 would be substantially similar to the impacts of the Project.

Construction activities for Alternative 2 would expose sensitive receptors to increased noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which generally prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. The Yosemite Slough bridge would be eliminated and noise resulting from bridge construction would be avoided. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction Best Management Practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels, similar to the Project.

Construction activities for Alternative 2 would result in a temporary or periodic increase in ambient noise that would be noticeable and likely cause for human annoyance. Construction activities would occur within 25 feet of existing and future residential uses. Pile driving activities could result in substantial noise levels of up to 107 dBA at new residential uses on the site or at adjacent existing residences. Construction-related temporary increases in ambient noise levels would be considered significant and unavoidable, the same as for the Project.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Mitigation measures MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction Best Management Practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under Alternative 2, but not to a less-than-significant level, as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of Alternative 2, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with Alternative 2, such as truck deliveries, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of Alternative 2 would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project.

Football games and concerts at the proposed stadium with Alternative 2 would generate noise that would adversely affect surrounding residents, similar to the Project. Implementation of mitigation measures

MM NO-7.1 and MM NO-7.2 would ensure that nearby residential uses do not experience temporary increases in ambient noise levels within their homes that would exceed 60 dBA L_{max}; however, as with the Project, the feasibility and practicality of mitigation measures MM NO-7.1 and MM NO-7.2 cannot be determined at this time, and, therefore, this impact would remain significant and unavoidable.

Cultural Resources

Similar to the Project, implementation of Alternative 2 would retain Drydocks 2 and 3 and rehabilitate Buildings 140, 204, 205, and 207 at the HPS Phase II site in accordance with the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. However, development under Alternative 2 would result in the demolition of Buildings 211, 231, and 253, which are historic resources in the potential CRHR-eligible Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. This would result in a significant impact because the proposed actions would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Implementation of the identified mitigation measures (MM CP-1b.1 and MM CP-1b.2) would reduce those impacts; however, this alternative would not reduce impacts to a less-than-significant level. Therefore, similar to the Project, the impacts to these historical resources would be significant and unavoidable.

Construction activities associated with Alternative 2 could result in a substantial adverse change in the significance of archaeological resources. The Project site overall is likely to contain subsurface archaeological resources from the Native American, Chinese fishing village, prehistoric, and maritime development periods. The Yosemite Slough bridge would be eliminated and potential disturbance of archaeological resources resulting from bridge construction would be avoided. Similar to the Project, construction activities associated with Alternative 2 could disturb archaeological resources, and result in potentially significant impacts. Implementation of the identified mitigation measure (MM CP-2a) would reduce the effects on archaeological resources to a less-than-significant level for development under Alternative 2, similar to the Project.

Construction activities associated with Alternative 2 could result in a substantial adverse change in the significance of paleontological resources. The Bay mud underlying portions of the fill is expected to contain paleontological resources. Similar to the Project, implementation of the identified mitigation measure (MM CP-3a) would reduce the effects of construction-related activities to potential paleontological resources in in-water and off-site areas to a less-than-significant level. The impact under this alternative would be similar to the Project.

Hazards and Hazardous Materials

Under Alternative 2, the construction impacts associated with Hazards and Hazardous Materials would be slightly reduced as compared to the Project because the overall development footprint would be reduced with the elimination of the Yosemite Slough Bridge, resulting in a smaller area subject to disturbance.

Site preparation would include deep excavations for large structures such as for residential towers, with plans to use the cut material elsewhere within the Project site as fill, trenching for utility lines, dewatering, grading and compaction and other earth-disturbing activities. As portions of the site are known to contain elevated levels of chemicals in the soil, construction activities could result in exposure of construction workers, the

public or the environment to unacceptable levels of hazardous materials if not handled appropriately. MM HZ-1a would reduce effects related to exposure of known contaminants at Candlestick Point by requiring compliance with Article 22A or an equivalent process. At HPS Phase II, potential effects related to exposure to hazardous materials from construction activities would be mitigated through requirements to comply with restrictions imposed on the property through the federal site clean-up process (MM HZ-1b, MM HZ-9, and MM HZ-12). Disturbance of contaminated soil would be reduced with elimination of the Yosemite Slough bridge but would still occur. MM HZ-10b would ensure approval of workplans by the Navy and regulatory agencies prior to any work in the shoreline areas. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts from disturbance of contaminated soil, groundwater and sediments.

At both Candlestick Point and HPS Phase II, compliance with MM HZ-2a.1 would require the preparation and implementation of contingency plans to address unknown contaminants that might be encountered during construction, and compliance with MM HZ-2a.2 would require preparation and implementation of health and safety plans to protect construction workers from exposure to hazardous materials during construction activities. Construction activities could require off-site transport of contaminated soil or groundwater; compliance with federal, state, and local regulations would ensure that no unacceptable exposure to chemicals occur as a result of these activities. Further, mitigation measures MM HY-1a.1, MM HY-1a.2, and MM HY-1a.3 would ensure that no unacceptable levels of hazardous materials in soil in surface runoff or in groundwater are discharged to the sewer system or discharged from the site to the Bay. Hazardous materials impacts from all of the above construction-related activities would be reduced to less than significant with the implementation of the mitigation measures identified above, the same as for the Project.

Development under Alternative 2, as for the Project, would require the installation of foundation support piles, which could, under certain soil conditions, create a vertical conduit for chemicals occurring in shallow groundwater to migrate to the deeper groundwater aquifer. However, MM HZ-5a, which requires preparation of a plan for pilot boreholes for each pile to prevent disturbance of potentially contaminated fill materials and would reduce this potential impact from pile driving to less than significant, the same as for the Project.

Elimination of construction of the Yosemite Slough Bridge would avoid impacts associated with disturbance of potentially radiologically impacted soils at HPS Phase II in the vicinity of Parcels E and E-2, thus reducing the potential for exposure to hazardous materials in soil or groundwater in this area.

All other development at HPS Phase II would be the same as that proposed for the Project and remedial activities would be the same for Alternative 2 as for the Project. Any remedial activities undertaken as part of the construction process would be subject to the requirements in MM HZ-1b, which requires construction activities at HPS Phase II to be done in accordance with all restrictions imposed on the site by the federal regulatory clean-up process and these impacts would be less than significant, the same as for the Project.

Potential impacts associated with disturbance of naturally occurring asbestos would be similar to those associated with the Project and would be mitigated through MM HZ-15, which requires the preparation of dust control plans as required by BAAQMD and DPH. Alternative 2 would involve the demolition of existing structures that may contain asbestos-containing building materials, lead-based paint and other

hazardous materials, the same as the Project. The existing regulatory framework and approval process would avoid potential hazards from demolition or building preservation activities and impacts would be less than significant, the same as the Project.

Alternative 2 would involve off-site roadway improvements, which could result in disturbance of hazardous material in soil or groundwater. Unacceptable exposures would be controlled as for the Project by implementation of MM HZ-1a, and hazardous materials impacts from these activities would be less than significant.

Project operations would involve routine use, storage, transport, or disposal of hazardous materials. The use of such materials would be the same as for the Project, as the development program is essentially the same. Compliance with applicable federal, state, and local regulations related to the use, storage and transport of such materials would result in a less-than-significant impact from hazardous materials usage, the same as for the Project.

Geology and Soils

Construction activities, such as removal of paved areas, grading, and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. However, requirements to control surface soil erosion during and after construction of Alternative 2 would be implemented through the requirements of the identified mitigation measure (MM HY-1a.1), and adverse effects on the soil such as soil loss from wind erosion and stormwater runoff would be reduced to a less-than-significant level. Soil erosion impacts associated with construction of the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 2.

Construction activities would have the potential to affect groundwater levels. Construction may include dewatering procedures during excavation, construction, and operation of foundations and buried utilities. The dewatering could cause settlement of adjacent soils that could damage the overlying foundations of existing buildings. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by the identified mitigation measure (MM GE-2a), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Similar to the Project, settlement hazards related to dewatering would be less than significant for development under Alternative 2.

Development of Alternative 2 would require rock removal activities at the Alice Griffith and Jamestown districts that could result in damage to structures from vibration or settlement caused by the fracturing of bedrock for excavation. With implementation of the identified mitigation measure (MM GE-3), vibration from controlled rock fragmentation in the area would not cause unacceptable settlement at adjacent or nearby properties. Similar to the Project, settlement hazards related to controlled rock fragmentation would be less than significant for development under Alternative 2.

The potential for exposure to adverse effects caused by seismic groundshaking and seismically induced ground failure such as liquefaction, lateral spreading, landslides and settlement exists at the Project site. The identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-5a, and MM GE-6a) would require design-level geotechnical investigations for development under Alternative 2. Design-level

geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of structures, as required by the SFBC through review by DBI. The structural design review would ensure that all necessary mitigation methods and techniques are incorporated in the design for foundations and structures to reduce potential impacts from ground failure or liquefaction to a less-than-significant level for development under Alternative 2. Seismic-related groundshaking hazards associated with the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 2, although these impacts are mitigated to less than significant under the Project.

The existing shoreline exhibits active erosion and consists of areas of unprotected slopes and dilapidated naval pier and wharf structures. Similar to the Project, Alternative 2 would include numerous shoreline improvements, including additional concrete revetments, creation of new beach and tidal habitat, and some grading and importation of fill at certain locations. These improvements would increase the stability of the shoreline. Therefore, Alternative 2 would not result in the exposure of structures and facilities at the Project site to substantial adverse effects caused by shoreline instability. Similar to the Project, the impact would be less than significant.

The potential for adverse effects caused by landslides, settlement, expansive and corrosive soils, exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual elements of development for Alternative 2, as specified in the identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-5a, MM GE-6a, MM GE-10a, MM GE-11a) for the Project. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of those mitigation measures, impacts with regards to landslides, settlement, and expansive and corrosive soils would be less than significant. Potential ground failure impacts associated with the Yosemite Slough bridge would be avoided because no bridge would be constructed under Alternative 2, although these impacts are mitigated to less than significant under the Project.

Hydrology and Water Quality

The footprint of development for Alternative 2 would be the same as for the Project, although the Yosemite Slough Bridge would not be constructed. As such, impacts from construction of Alternative 2 would be similar to the Project. As the footprint of development, the total amount of development, and land uses would be the same as the Project, operational impacts to hydrology and water quality would be the same as with the Project.

With adherence to applicable regulatory requirements, construction activities associated with Alternative 2 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. As the footprint of development, and the total amount of development would be the same as the proposed project with the exception of the construction of the Yosemite Slough Bridge, impacts would be similar to the Project. With implementation of mitigation measures MM HY-1a.1 (preparation of a SWPPP for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

Groundwater would not be used for any construction activities such as dust control or irrigation of vegetated erosion control features; no groundwater wells would be developed as part of the Project or and no on-site groundwater wells would be used for water supplies. Short-term construction groundwater dewatering may be necessary at certain locations (e.g., for installation of building foundations or underground utilities), but dewatering would have only a minor temporary effect on the groundwater surface table elevation in the immediate vicinity, and would not measurably affect groundwater supplies. Under Alternative 2, the extent of impervious surfaces would be the same as the Project, and would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within the Project site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of Alternative 2, the existing drainage patterns within the area would generally be preserved. Construction activities associated with Alternative 2 would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated Alternative 2, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2, (preparation of a SWPPP) impacts would be less than significant, similar to the Project.

Operation of Alternative 2 would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of Alternative 2. In addition, this alternative would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the Project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As the extent of impervious surfaces for Alternative 2 is the same as the Project, impacts would be the same as the Project. Development of

Alternative 2 would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of Alternative 2 could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exist at or near the site currently, or result in substantial erosion, siltation, or flooding on or off site, similar to the project. Implementation of Alternative 2 would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a Stormwater Drainage Master Plan (SDMP) and Stormwater Control Plan (SCP) to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of Alternative 2 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of Alternative 2 would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, Alternative 2 would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

Similar to the Project, Alternative 2 would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt). Alternative 2 would also have the potential to affect designated critical habitat of the green sturgeon and Central California Coast steelhead and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. In addition, activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the *Migratory Bird Treaty Act* (MBTA). Alternative 2 would include implementation of the ecological design features described in the Project's Draft Parks, Open Space, and Habitat Concept Plan that would result in multiple measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the design components would remove invasive species; restore, preserve, and enhance wetland, aquatic, and grassland habitats; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline. Alternative 2, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-6a.1, MM BI-6a.2, MM BI-6b, MM BI-7b, MM BI-9b, MM BI-18b.1, and

MM BI-18b.2) and ecological design features, would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or United States Fish and Wildlife Service (USFWS). Similar to the Project, this impact would be less than significant after mitigation for development under Alternative 2. However, impacts to such species would be less than the Project due to the avoidance of impacts associated with bridge construction and operation.

Similar to the Project, development of Alternative 2 could have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG or USFWS. The only sensitive habitats other than wetlands and aquatic habitats are eelgrass and areas designated as Essential Fish Habitat (EFH). Shoreline improvements, shoreline abutments for the proposed marina and installation of the breakwater at HPS Phase II could have substantial adverse impact to the communities. However, with implementation of the identified mitigation measures (MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12b.1, MM BI-12b.2, MM BI-12b.3, MM BI-18b.1, MM BI-18b.2, MM BI-19b.1, and MM BI-19b.2), impacts of Alternative 2 on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG, NMFS, or USFWS would be reduced to a less–than-significant level. Potential impacts to eelgrass beds would be the same as the Project (eelgrass beds are not located near Yosemite Slough), while impacts to EFH would be less than the Project since construction associated with Yosemite Slough bridge would be avoided and, thus, EFH would not be impacted through the construction of pilings required to support the bridge.

The shoreline improvements included in Alternative 2 would be similar to the Project and could have substantial temporary and permanent adverse effect on federally protected wetlands and other waters as defined by Section 404 of the *Clean Water Act* (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Those impacts would be reduced (0.01 acre of tidal salt marsh, 0.70 acre of other waters, and 0.96 acre of shadow fill) compared to the Project because the Yosemite Slough bridge would not be constructed. Therefore, potential impacts to federally protected wetlands and other waters would be less than the Project. The identified mitigation measures would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the US Army Corps of Engineers (USACE), the San Francisco Regional Water Quality Control Board (SFRWQCB), and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of the identified mitigation measures (MM BI-4a.1 and MM BI-4a.2), the impacts of development under Alternative 2 to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level.

Development of Alternative 2 could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The Project site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Project site. However, similar to

the Project, implementation of Alternative 2 would place new residential towers and a stadium with light towers along a portion of the San Francisco Bay shoreline. The increase in strike hazards from the tall buildings and the potential for lighted stadium towers to alter flight paths could substantially interfere with migratory avian flight paths, which would be considered a potentially significant impact to migratory birds. With respect to aquatic species, although migratory fish could continue to move though the open water and Yosemite Slough, the Project site does not contain any substantial migratory fish pathways such as anadromous fish streams. However, construction of breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact eelgrass beds such that productivity and survival of these habitats would be substantially reduced. Similar to the Project, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-20a.1, and MM BI-20a.2), the potential impacts of Alternative 2 would be reduced to a less-than-significant level because it would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Similar to the Project, Alternative 2 would be required to comply with mitigation measure MM BI-14a to ensure that Project development would not result in conflicts with the City's tree protection ordinances. With implementation of MM BI-14a, Alternative 2 would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant, similar to the Project.

Public Services

Police Protection

During construction of Alternative 2, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. The purpose of a CTMP is to ensure that the impacts of construction on the public domain, in particular with respect to temporary interruptions to vehicular and pedestrian traffic, are considered and addressed. Because Alternative 2 would include the same mitigation as the Project, there would be a similar requirement to prepare a CTMP for Alternative 2 that would address temporary impacts on circulation during construction. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. Construction activities associated with implementation of Alternative 2 also could increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. To ensure adequate site security, mitigation measure MM PS-1 would require the Project Applicant to provide security during construction. Therefore, this impact would be less than significant, the same as for the Project.

Implementation of Alternative 2 would increase resident and employee population at the Project site, resulting in a potential increase in the need for 53 additional police personnel to provide a comparable level of service to existing conditions, the same as for the Project. The SFPD evaluates the need for additional officers by sector, and not station or district needs. While it is unlikely that 53 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development of Alternative 2.

If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 square feet (sf) could be constructed within the Project site, on land designated for community-serving uses. As part of this alternative, up to 100,000 gross square feet (gsf) divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses, including a police station. Construction of a new SFPD facility (counter, storefront, or other configuration) within these community services uses and/or the reconfiguration or expansion of the existing Bayview Station would be funded by the Project Applicant. Similar to the Project, Alternative 2 includes community service use areas, and as construction would be funded by the Project Applicant, the SFPD would maintain acceptable levels of police service. Therefore, development of this Alternative would not require new or physically altered police facilities beyond the scope of the Project in order to maintain acceptable police services. This impact is considered less than significant, similar to the Project.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Fire and Emergency Medical Services

During construction of Alternative 2, emergency access to the Project site would be maintained through compliance with the CTMP, required by mitigation measure MM TR-1. Alternative 2 would add 10,500 residential units and substantially increase employment-generating uses, resulting in an employment population of 10,730. The increase in the residential and daytime employment population (for a total population of 35,195, including a residential population of 24,465 plus 10,730 employees), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services. As Alternative 2 would implement the same land use program as the Project, the demand for emergency services would be the same as for the Project.

Construction of a new SFFD facility on land designated for community-serving uses on the Project site (where costs would be borne by the Project Applicant), would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. Similar to the Project, construction of 100,000 gsf of community facilities, which would include a new SFFD facility, would be included as a component of Alternative 2. Similar to the Project, prior to construction of new land uses at HPS Phase II, review of access strategies for game day and non-game day scenarios would be required pursuant to the SFFD's plan review requirements.[1350] Therefore, development under Alternative 2 would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

[1350] San Francisco Fire Department, Plan Check website. http://www.sfgov.org/site/sffd_page.asp?id=57395 (accessed August 2009).

Schools

A total of approximately 2,131 school-age children would live within the Project site following full build-out of Alternative 2. While schools in the Project vicinity have approximately 49 percent capacity remaining in the 2008/09 school year, it is likely that a 12 percent overcapacity of SFUSD as a result of citywide population growth by 2030 would occur. Similar to the Project, the payment of school impact fees pursuant to SB 50 would constitute full mitigation for any potential schools impacts. This impact is considered less than significant for development under Alternative 2, the same as for the Project.

Libraries

Construction of Alternative 2 would not result in impacts to the San Francisco Public Library system (SFPL). No library branches are located on the Project site. All library services would be available to the community throughout the duration of construction. As such, no impact to library services during construction of Alternative 2 would occur.

Residential and nonresidential development associated with Alternative 2 would increase demand for local library services in the Bayview neighborhood. Although this alternative would result in a substantial direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the Portola, Visitacion Valley, and the Bayview branches would continue to meet the demands of the community. In addition to the three library branches serving Alternative 2, the proposed development would include space dedicated to library services to supplement the Bayview branch library. As part of Alternative 2, a 1,500 gsf reading room and automated book-lending machines would be integrated into the community retail and public facilities uses. The SFPL branches, and the dedication of space to accommodate library services on the Project site in order to supplement SFPL branches, would accommodate increased demand from development under this Alternative. No additional library facilities would be required to accommodate development of Alternative 2. Therefore, no new or physically altered library facilities would be required in order to maintain acceptable service ratios and this impact is considered less than significant for development under Alternative 2, the same as for the Project.

Recreation

Implementation of Alternative 2 would include the same parks and open space areas as the Project. Similar to the Project, Alternative 2 would also include a land agreement with the CPSRA, which would result in improvements to the CPSRA. Construction activities associated with the proposed parks and recreational facilities are considered part of the overall development footprint. Since this Alternative is so similar to the Project, construction impacts anticipated to result from implementation of this Alternative are analyzed throughout the technical sections of this EIR. Such impacts would be temporary and would be mitigated by measures identified in Section III.D (Transportation and Circulation), Section III.H (Air Quality), Section III.I (Noise), and Section III.K, Section III.M, and Section III.N (Biological Resources). These measures address construction-related impacts including, but not necessarily limited to, traffic and circulation, air quality, noise, exposure to hazardous material, and soil erosion, which would help reduce potential impacts to recreational resources. Construction impacts associated with development of new parks and recreational facilities would, therefore, be less than significant as demonstrated in the sections referred to above, the same as for the Project

At build-out of Alternative 2, the projected population within the Project site would increase from approximately 1,113 residents to approximately 24,465 residents, while employment would increase from 529 jobs to approximately 10,730 jobs. Similar to the Project, parks and open space included in Alternative 2 would provide a ratio of about 14 acres of parkland per thousand residents, which is substantially higher than the benchmark ratio of 5.5 acres per thousand residents (refer to Section III.P). The increase in population and employment could result in an increase in the use of existing parks, recreational facilities, and open space. However, similar to the Project, new and improved parks, recreational facilities, and open space would be provided as part of this alternative and would meet the increase in demand created by new residents and employees. During a given phase, however, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual, and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed. Therefore, Alternative 2 would not result in substantial physical deterioration of existing parks and recreational facilities and impacts associated with the increase in demand for parks and open space would be less than significant, the same as for the Project.

The high-frequency BRT route around Yosemite Slough, rather than over the slough on the Yosemite Slough bridge as proposed under the Project, presents more at-grade bicycle and pedestrian conflicts for residents of the Bayview District seeking access to the slough and the Bay Trail. In the Project, the BRT is physically separated from the Bay Trail and connecting bicycle/pedestrian trails, eliminating crossing conflicts between the Bay Trail and the Bayview. This is a potentially significant impact that would not occur under the Project.

A windsurfing launch site is located in CPSRA. The tower plan at Candlestick Point would be the same as the Project. Windsurfing could potentially be impacted by the construction of tall structures at Candlestick Point in close proximity to the Bay that affect wind patterns and direction. Similar to the Project, windsurfing would not be substantially affected by build-out of Alternative 2.

Utilities

Water Supply

Alternative 2 would include the same water infrastructure as the Project. Impacts of construction activities associated with this infrastructure, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J (Cultural Resources and Paleontological Resources), Section III.K, Section III.L (Geology and Soils), Section III.M, Section III.O (Public Services), and Section III.S (Greenhouse Gas Emissions) of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of water conveyance or treatment infrastructure associated with the Project. The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with Alternative 2.

Alternative 2 would have the same residential and non-residential build-out as the Project and generate a total demand of approximately 1.67 mgd. As current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Alternative 2 on water demand would be an increase of

approximately 1.37 mgd.[1351] As stated in the Water Supply Assessment provided for the Project, the SFPUC projects that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions (refer to Appendix Q1). Therefore, there would be sufficient water supplies to accommodate the water demand of Alternative 2. This is considered to be a less-than-significant impact. Similar to the Project, implementation of Alternative 2 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant.

Implementation of Alternative 2 would require expansion of the existing off-site AWSS by providing an AWSS loop at Candlestick Point that would connect to the planned extension of the existing off-site AWSS on Gilman Street from Ingalls Street to Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road. Implementation of the identified mitigation measure (MM UT-2) would ensure the provision of adequate water for on-site fire-fighting purposes, and the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact is less than significant with implementation of this mitigation measure, the same as for the Project.

Wastewater

Under Alternative 2, the Candlestick Point development would discharge a maximum peak flow of 1,479 gpm to the Candlestick tunnel sewer, which has an existing unused capacity of 28,035 gpm in dry weather. This flow would combine with a maximum peak flow of 979 gpm from the HPS Phase II into the Hunters Point tunnel sewer. The total maximum peak Project flows of 2,458 gpm would combine in the Hunters Point tunnel sewer, which has an existing unused capacity of 69,853 gpm in dry weather. This represents 3.5 percent of the available capacity of the Hunters Point tunnel sewer, which could be accommodated by the existing off-site infrastructure.

The wastewater generated under Alternative 2 would be the same as the Project. As with the Project, it is possible that a temporary increase in CSO volume could occur during wet weather if structures are occupied and contribute wastewater to the Combined Sewer System prior to completion of the separate stormwater and wastewater infrastructure of Alternative 2. Implementation of the identified mitigation measure (MM UT-3a) would ensure that there would be no increase in CSO flows as a result of the Project by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. The impact on the Combined Sewer System would be reduced to less than significant, the same as the Project

The wastewater generated under Alternative 2 would be the same as the Project. The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the Project development. Overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows, assuming completion of utility infrastructure prior to occupancy of Alternative 2. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of the Project. It is possible that a temporary increase in CSO volume could occur

[1351] Water demand for this alternative was estimated by prorating water demand for the Project (presented in Table III.Q-4) based on build-out of Alternative 2.

(which could affect the capacity of the SWPCP for treatment) during wet weather, as noted, above. Implementation of the identified mitigation measure (MM UT-3a) would reduce this impact to less than significant by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. Thus, the Project would not result in any net increase in CSO volume in the Bayside system during wet weather. A less-than-significant impact to existing off-site treatment facilities would occur, the same as the Project

Development associated with Alternative 2 would incrementally contribute wastewater during dry and wet-weather events to the Combined Sewer System operated by the SFPUC, but overall, wet-weather volumes would decrease in the Bayside system with construction of the Project's separate stormwater and wastewater systems. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that the Alternative 2 would not exceed the applicable wastewater treatment requirements of the RWQCB. In addition, Alternative 2 would not cause the City to exceed the requirements of the NPDES permit for the reasons previously stated and because the flows during wet weather would actually decline compared to existing flows from the Project site. This impact would be less than significant, the same as the Project.

Solid Waste

Demolition of existing facilities within the Project site under Alternative 2 would generate approximately 971,785 tons of construction debris. Some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. With implementation of the identified mitigation measure (MM UT-5a), the Project Applicant would be required to submit a Waste-Diversion Plan demonstrating strategies to divert at least 75 percent of total construction wastes before receiving building permits. This would reduce construction debris transported to the landfill to 25 percent, or 242,946 tons. At an average density of 1 ton per cubic yard, this equals 242,946 cubic yards, or 0.5 percent of the available capacity at Altamont Landfill as of 2009.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1352] Under Alternative 2, demolition activities, which generate construction debris, are expected to conclude in 2024 at Candlestick Point and in 2021 at HPS Phase II, a minimum of five years before the landfill is expected to close. Further, the City requires the diversion of at least 65 percent of construction waste, as also required by MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Alternative 2 on solid waste would be further reduced. The impact of the construction waste generated by the Alternative 2 on the capacity of the Altamont Landfill would be less than significant, substantially similar to the Project.

Construction activities, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur

[1352] CIWMB, 2009.

intermittently during the construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes (refer to Setting). Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. Contaminated soils may require transportation off site and treatment at authorized TSDs. Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of Alternative 2 would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact, substantially similar to the Project.

At full build-out, Alternative 2 would generate approximately 21,827 tons annually when all uses are fully operational and assuming no waste-reduction measures. This would represent approximately 3.7 percent of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons). All residents and businesses of Alternative 2 would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant would prepare a Site Waste Management Plan as required by the identified mitigation measure (MM UT-7a.1) that would specify the methods by which the Alternative 2 would divert operational solid waste to assist the City in achieving its diversion goals. The impact of operational solid waste generated by Alternative 2 on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant, the same as the Project.

Nearly all uses under Alternative 2 would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this stage of Project development. Therefore, it is assumed that a variety of hazardous materials could be used in small quantities, ranging from R&D in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios, and the marina, where small quantities of fuel could be utilized. The amounts of hazardous waste that would be generated by such uses would not be substantial. In addition, new residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Because the minimal amount of hazardous waste that would be generated by the Alternative 2 could be accommodated by existing TSD facilities, this impact would be less than significant, the same as the Project.

Electricity, Natural Gas, and Telecommunications

The proposed utility infrastructure improvements for Alternative 2 would include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications, the same as for the Project. As the only difference between this alternative and the Project is the elimination of the Yosemite Slough bridge and diversion of traffic around the Yosemite Slough instead of across it, utility infrastructure would not be substantially different from that proposed under the Project. Therefore, impacts would remain the same as the Project, and less than significant.

Energy

Construction activities associated with implementation of Alternative 2 would require energy sources including electricity, diesel, and gasoline. Similar to the Project, the construction activities for Alternative 2 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy and would be subject to requirements to minimize wasteful fuel consumption. Energy use during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge would not occur. Furthermore, given the type of development proposed under this Alternative, the energy demand created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related energy use associated with development under Alternative 2 would be considered less than significant.

Implementation of Alternative 2 would result in baseline electricity consumption similar to the Project and would include the energy savings associated with the Project Applicant's commitment to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, those efficiency measures would result in consumption of at least 5.4 percent less electricity than a project that would not implement such measures. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts of Alternative 2 to less than significant.

Implementation of Alternative 2 would result in baseline natural gas consumption similar to the Project and would include efficiency measures similar to the Project resulting in the use of approximately 13 percent less natural gas than a development project without such measures. Those efficiency measures would result in consumption of at least 13 percent less natural gas than a development project without such measures. In addition, the Project Applicant will also implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity and the use of solar thermal energy to provide space cooling with the use of absorption systems and/or water for space heating and domestic water systems. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential natural gas consumption impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts to less than significant.

Alternative 2 would increase trips to and from the Project site, increasing the use of petroleum fuels. Based on average fuel efficiencies for the City and a VMT similar to that of the Project, this Alternative would result in a demand for 14.01 million gallons of gasoline and 0.93 million gallons of diesel annually. Similar to the Project, fuel consumption resulting from travel to and from the Project site would be five times as high as under existing conditions, indicating a large increase in consumption. However, this consumption would not be wasteful because (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. However, Alternative 2 lacks the direct, grade-separated BRT connection between Candlestick Point and HPS Phase II that the Yosemite Slough bridge would provide in the Project. This would result in an estimated delay of up to 7 minutes in transit travel times, which would result in fewer transit trips and more automobile trips and an increase in consumption of energy. Similarly, reductions in walking and bicycle trips between Candlestick Point and HPS Phase II that would be accommodated on the Project's bridge could result in increased drive trips and energy use.

Nevertheless, these reductions in transit, bicycle, and pedestrian trips and resulting increases in automobile trips would not likely create a significant energy consumption impact when compared to the Project. Therefore, similar to the Project, Alternative 2 would not be wasteful with respect to petroleum fuel consumption, and impacts are considered less than significant.

Greenhouse Gas Emissions

Similar to the Project, construction activities associated with implementation of Alternative 2 would emit GHGs associated with diesel and gasoline consumption. Similar to the Project, the construction activities for Alternative 2 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not be a prolonged source of GHG emissions. GHG emissions during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge would not occur. Furthermore, given the type of development proposed under this Alternative, the GHG emissions created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related GHG emissions and climate change associated with development under Alternative 2 would be considered less than significant.

Implementation of Alternative 2 would result in baseline GHG emissions similar to the Project and would include the GHG emission reductions associated with mitigation measures, including MM GC-1 through MM GC-4, which require the implementation of the Project Applicant's conceptual commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, Alternative 2 would increase trips to and from the Project site compared to existing conditions, increasing the GHG emissions associated with transportation.

However, this Alternative would also include the Project Applicant's commitment to reduce transportation related GHG emissions: (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of GHGs emitted by shortening trip lengths and shifting trips from vehicular modes of travel. Similar to the Project, those efficiency measures would result in approximately 51 percent less GHG emissions than a project that would not implement such measures. However, Alternative 2 lacks the direct, grade-separated BRT connection between Candlestick Point and HPS Phase II that the Yosemite Slough bridge would provide in the Project. This would result in an estimated delay of up to 7 minutes in transit travel times, which would result in fewer transit trips and more automobile trips and an increase in consumption of energy. Similarly, reductions in walking and bicycle trips between Candlestick Point and HPS Phase II that would be accommodated on the Project's bridge could result in increased drive trips and energy use.

Nevertheless, these reductions in transit, bicycle, and pedestrian trips and resulting increases in automobile trips would not likely create a significant energy consumption impact when compared to the Project. Similar to the Project, Alternative 2 would not be wasteful with respect to petroleum fuel consumption. Thus, GHG emissions at the Project site under development of Alternative 2 would not inhibit the achievement of the goals of AB 32 or the SFCAP. Similar to the Project, GHG emissions and climate change impacts would be less than significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2nd. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for Alternative 2 and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO2e per service population per year and would result in a less-than-significant impact on climate change. Alternative 2 would not measurably change the parameters of the Project land use program, and thus this analysis applies to Alternative 2.

Attainment of Project Objectives

Alternative 2 would meet most of the Project objectives, although it would meet transportation-related objectives to a lesser extent than the Project because this Alternative would not include the Yosemite Slough bridge. Refer to Table VI-4 (Attainment of Project Objectives Alternative 2) below for a discussion of each objective.

Table VI-4 Attainment of Project Objectives Alternative 2

Objective	*Meets Project Objective?*	*Analysis*
1. The integrated development should produce tangible community benefits for the Bayview and the City.	Y-	Alternative 2 would include the same development program and uses as the Project, resulting in the same range of job and economic development opportunities. This alternative would renovate and replace the artist studios at HPS Phase II and create a permanent space for artists. Alternative 2 would include the same shoreline improvements and open space network including a Bay Trail extension along the shoreline and the same improvements to the CPSRA as the Project. However, there would be no grade-separated, direct transit connection and no continuous shoreline and open space access between Candlestick Point and HPS Phase II because the Yosemite Slough bridge would not be constructed. Therefore, while Alternative 2 would meet this Project objective, it would not meet it to as great an extent as the Project.
2. The integrated development should re-connect Candlestick Point and the Hunters Point Shipyard site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents.	Y-	Alternative 2 would include the same development program and uses as the Project. The proposed mix of uses and urban design concepts would provide a direct physical, visual, and architectural connection to the Bayview neighborhood and City. This alternative also includes extension of the transportation network into the Project site. Those connections would allow residents of the Bayview neighborhood and City to access the commercial, cultural, and institutional opportunities at the Project site. However, this alternative would not include the Yosemite Slough bridge (thereby precluding a direct connection between CP and HPS, particularly for transit). Therefore, while Alternative 2 would meet this Project objective, it would not meet it to as great an extent as the Project.
3. The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourages the rebuilding of Alice Griffith Public Housing.	Y	Alternative 2 would include a variety of unit types, sizes, and structures, and a wide range of affordability levels. This alternative would also include the redevelopment of the Alice Griffith Public Housing site. Therefore, Alternative 2 would meet this Project objective.
4. The integrated development should incorporate environmental sustainability concepts and practices.	Y	Alternative 2 would include the same sustainability principles and concepts as the Project. Therefore, Alternative 2 would meet this Project objective.
5. The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure.	N	Alternative 2 would provide automobile, public transportation, and pedestrian connections similar to the Project. However, this alternative would not include construction of the Yosemite Slough bridge. Therefore, this Alternative 2 would not facilitate the efficient handling of game day traffic to as great an extent as the Project. Therefore, Alternative 2 would not meet this Project objective.
6. The integrated development should be fiscally prudent, with or without a new stadium.	Y	Development of Alternative 2 would increase sales tax revenue to the City to a similar extent compared to the Project and include a development program that would encourage substantial private capital investment. Alternative 2 would meet this Project objective.

Y = Alternative does meet Project objective.
Y- = Alternative meets Project objective, but to a lesser extent than the Project.
Y– = Alternative meets Project objective, but to a significantly lesser extent than the Project.
N = Alternative does not meet Project objective.

Alternative 2 analyzes the full Project land use program without construction of the Yosemite Slough bridge. Generally, travel demand associated with all Variants and Alternatives studied would be similar with or without the Yosemite Slough bridge. Because the Yosemite Slough bridge would not accommodate auto travel on non-game days, the traffic circulation patterns are expected to be the same under Alternative 2 as the Project. Similarly, since auto traffic would only use the bridge on game days for any Alternative or Variant considered, the typical non-game day travel patterns for any of the Alternatives or Variants that include the bridge would be the same under conditions without the bridge. If Variants 1 (R&D Variant), Variant 2 (Housing Variant), or Variant 2A (Housing/R&D Variant) were approved, and no bridge were constructed, the impacts would not increase from those identified for Variant 1, Variant 2, or Variant 2A with the bridge. In fact, all operational and construction impacts associated with the bridge, although identified as less than significant, would be eliminated.

Without the bridge across Yosemite Slough, the proposed new BRT route traveling between Balboa Park BART Station and the Hunters Point Shipyard Transit Center would follow a different alignment than under the Project. Instead of a direct route across Yosemite Slough, the BRT route would travel west along Carroll Avenue, north along Hawes Street, and then west on Armstrong Avenue, where it would join the Navy railroad right-of-way. The BRT route would travel in the railroad right-of-way around Yosemite Slough, rejoining the existing roadway network at Shafter Avenue. The route would continue east on Shafter Avenue to Arelious Walker, where it would reassume the same alignment as the Project.

This additional travel distance and travel time would have a notable effect on passengers who use the BRT to travel to or from the Hunters Point Shipyard (the analysis indicates a reduction of 15 percent for these trips). However, because this represents a relatively small portion of overall Project-generated transit riders, the overall change in transit ridership and auto trip generation is negligible. This conclusion applies to any Variant or Alternative that was analyzed assuming a bridge over Yosemite Slough.

Operation of the BRT within the rail right-of-way would not affect study intersection operations. Therefore, the traffic impacts associated with Alternative 2 would be the same as the Project. Similarly, traffic impacts associated with any Variant or Alternative that was analyzed assuming a bridge over Yosemite Slough would be the same as the equivalent Variant or Alternative without the bridge.

VI.C.3 Alternative 3: Reduced CP-HPS Phase II Development; San Francisco 49ers Stay at Existing Candlestick Park Stadium; Limited State Parks Agreement; Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians

Summarized Description

Alternative 3 is a reduced-development alternative, including a reduction in residential units by approximately 50 percent and by approximately 28 percent in commercial development. This alternative assumes that the 49ers football team would continue to use the existing Candlestick Park stadium and HPS Phase II would not include a new stadium. Consequently, the population growth anticipated under this alternative would be approximately 12,319 compared to approximately 24,465 under the Project. A limited State Parks agreement would occur to allow redevelopment of the Alice Griffith Public Housing site and construction of the Yosemite Slough bridge and approach. Alternative 3 would not include other new development at Candlestick Point.

Table VI-5 (Comparison of Alternative 3 and Project Build-Out) presents a comparison of the uses proposed on the Project site under the Project and Alternative 3. Figure VI-2 (Alternative 3 Land Use Plan) illustrates the land use plan for Alternative 3.

Detailed Description

Candlestick Point

New development at Candlestick Point with Alternative 3 would include replacement of the Alice Griffith Public Housing and the construction of 1,210 additional housing units at the site. Alternative 3 would include a limited State Park agreement to provide a right-of way for transit, bike, and pedestrians on the Yosemite Slough bridge because the bridge approach at Candlestick Point would cross the CPSRA. The agreement would also allow for the redevelopment of the Alice Griffith Public Housing site, including 2.43-acres of State Parks–owned land. Compared to the Project, no retail, community service, hotel, or parks and open space uses would be developed. The existing Candlestick Park stadium and parking would remain. Besides the limited State Parks agreement, the CPSRA would remain and retain its existing configuration. All other existing uses at Candlestick Point would remain.

HPS Phase II

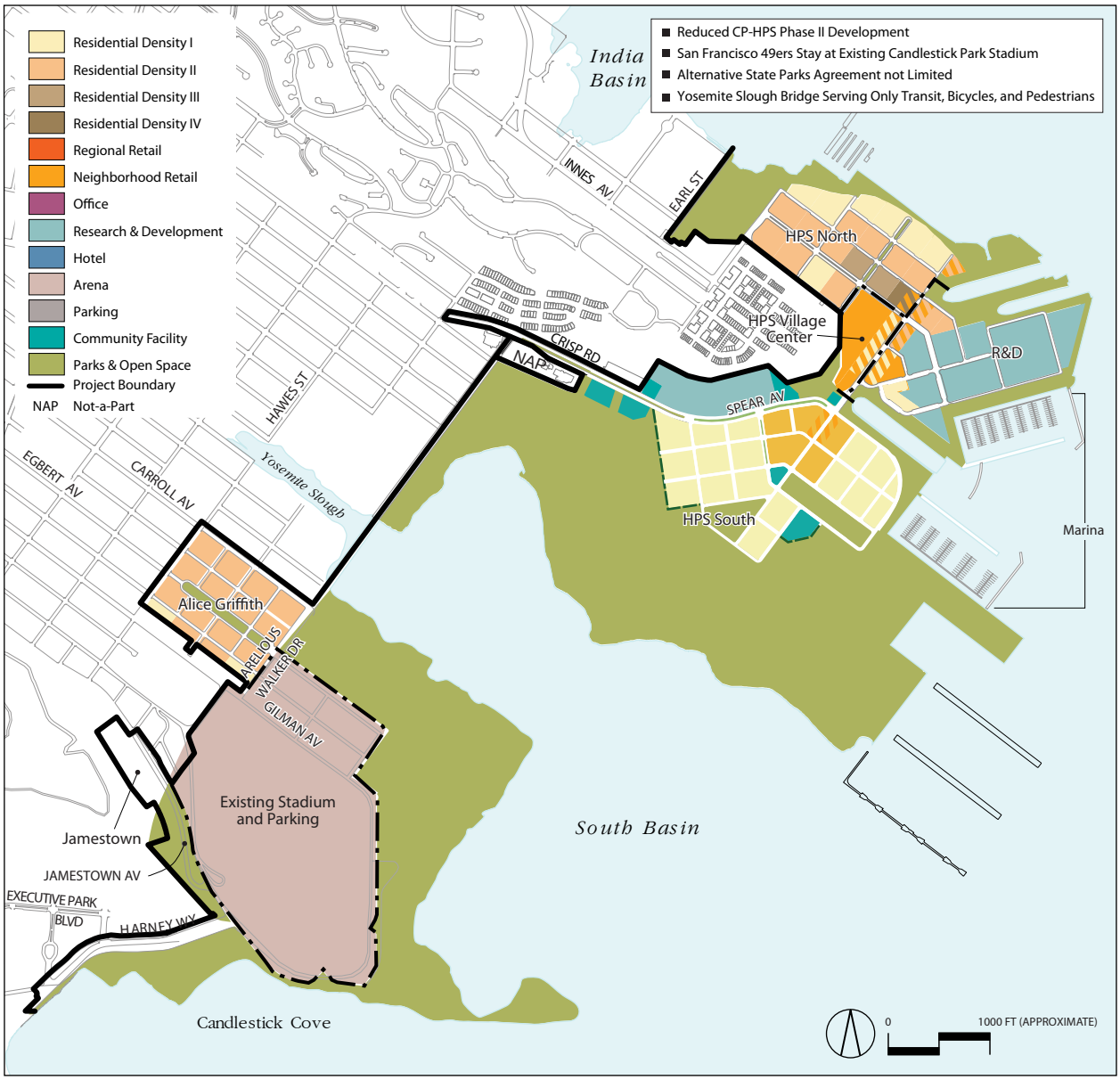
The Alternative 3 land use program at HPS Phase II would include development of 4,000 housing units, 1,350 more units than proposed at the HPS Phase II site with the Project. The additional housing would be in the HPS South district, the site of the proposed stadium under the Project. All other uses would be the same as the Project, including retail, R&D, artists' studios, community services, marina, and parks and open space. Figure VI-2 illustrates the land use plan for Alternative 3.

Table VI-5 Comparison of Alternative 3 and Project Build-Out

Use	*Alternative 3*	*Project*	*Comparison to Project*
Candlestick Point			
Residential (units)	1,210	7,850	-6,640
Retail (gsf):	0		
Regional Retail	0	635,000	-635,000
Neighborhood Retail	0	125,000	-125,000
Community Services	0	50,000	-50,000
Hotel (gsf)	0	150,000	-150,000
Office (gsf)	0	150,000	-150,000
10,000-seat Arena (gsf)	0	75,000	-75,000
Football Stadium (seats)	70,000 (existing)	0	70,000
HPS Phase II			
Residential (units)	4,000	2,650	+1,350
Neighborhood Retail (gross square feet - gsf)	125,000	125,000	0
Research & Development (gsf)	2,500,000	2,500,000	0
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Community Services	50,000	50,000	0
Football Stadium (seats)	0	69,000	-69,000
Marina (slips)	300	300	0
Totals			
Residential (units)	5,210	10,500	-5,290
Retail (gsf)	125,000	885,000	-760,000
Community Services	50,000	100,000	-50,000
Research & Development (gsf)	2,500,000	2,500,000	0
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Other Elements			
Yosemite Slough bridge	Transit, bike, and pedestrians only	Yes	—
Football stadium (seats)	0	69,000	-69,000
Shoreline Improvements	Yes	Yes	—
State Park Agreement/total acres of State Parkland	Yes/117.2[a]	Yes/96.7	+21.5

SOURCE: Lennar Urban, PBS&J, 2009.

a. Limited exchange of 3.03 acres to construct BRT/pedestrian only Yosemite Slough bridge and Alice Griffith Public Housing



SOURCE: Lennar Urban, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE VI-2 Candlestick Point — Hunters Point Shipyard Phase II EIR

ALTERNATIVE 3 LAND USE PLAN

Transportation and Circulation (with Transit, Bike, and Pedestrian-Only Yosemite Slough Bridge)

A new Yosemite Slough bridge serving transit, bike, and pedestrian traffic only would extend Arelious Walker Drive from Candlestick Point to HPS Phase II. The bridge would be approximately 40 feet wide and would cross the Slough at its narrowest point at the same location as the Project. The bridge and its approach streets would have two dedicated transit lanes and a separate Class I bicycle and pedestrian lane, which would be open at all times.

The primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.

Basis for Impact Analysis

For the Project, the potential impacts are generally based on the parameters of the Project, which include the size, bulk, and type of development, the footprint of development, and the number of residents, employees, and visitors to the Project site. For Alternative 3, the impacts of the Project are compared to the impacts of a reduced development program. The development program of Alternative 3 would be the same as the development program of the Project, with the following exceptions:

- Construction of 5,210 residential units, which is approximately 50 percent less than the Project
- Construction of 125,000 gsf of neighborhood retail and 50,000 gsf of community services space, which is 50 percent less than the Project
- No construction of regional retail, office, hotel, or arena uses
- Development at Candlestick Point would only include redevelopment of the Alice Griffith Public Housing site and the bridge approach to the Yosemite Slough
- A limited State Parks land agreement that allows for redevelopment of the Alice Griffith Public Housing site and construction of the south approach to the Yosemite Slough bridge
- The San Francisco 49ers stadium at HPS Phase II would not be constructed and the existing Candlestick Park stadium would remain
- Development at the proposed San Francisco 49ers stadium site at HPS Phase II would include residential and retail uses
- Construction of the Yosemite Slough bridge for transit, bicycle, and pedestrian use only (no automobile use)

With a limited State Parks land agreement, there would be a reduced funding mechanism for future maintenance of the parks on site. Additionally, approximately 21 acres of State Parks land would not be transferred for development at Candlestick Point compared to the Project.

Potential Impacts

Land Use and Plans

Implementation of Alternative 3 would require amendments similar to the Project for the following planning documents: *City of San Francisco General Plan*, *Bayview Hunters Point Redevelopment Plan*, *Hunters Point Shipyard Redevelopment Plan, Bay Plan*, *San Francisco Bay Area Seaport Plan*, and *CPSRA General Plan*. However, with implementation of the requirements and mitigation measures identified for the Project in Section III.C through Section III.S of this EIR, development under Alternative 3 would not conflict with any applicable land use plans, policies, or regulations (of an agency with jurisdiction) adopted for the purpose of avoiding or mitigating an environmental effect. Furthermore, development under this Alternative would not conflict with any of the policies, goals, and strategies analyzed for the Project. Similar to the Project, this impact would be less than significant.

Implementation of Alternative 3 would not result in a substantial adverse change in the existing land use character. While Alternative 3 would provide 50 percent fewer residential units than the Project, development under this Alternative would still improve the character of the Alice Griffith Public Housing site and substantially change HPS Phase II from industrial uses to an urbanized area representative of other areas in San Francisco. This change would improve deteriorated conditions and connectivity, as well as provide numerous areas of open space, extensive landscaped areas, pleasing architecture, and shoreline improvements, all of which would improve the character of the site. Furthermore, without construction of the San Francisco 49ers stadium and the continuance of Candlestick Park stadium, changes to the existing land use character would be less than those created by the Project. Therefore, changes resulting from development under Alternative 3 would not be considered adverse changes. Furthermore, the transition in scale between adjacent neighborhoods and development under this Alternative, as well as the varied range of proposed uses at HPS Phase II would not result in a substantial adverse change in the existing land use character of the Project area. Similar to the Project, this impact would be less than significant.

With a limited State Parks land agreement, there would be minimal changes to State Parks land use within the Project site; the agreement only provides enough land to redevelop the Alice Griffith Public Housing site and the south approach to the Yosemite Slough bridge. Approximately 21 acres of State Parks land would not be transferred for development at Candlestick Point compared to the Project. Therefore, there would be minimal impacts to the land use character of State Parks, which would be less than the Project.

Population, Housing, and Employment

Construction activities associated with implementation of Alternative 3 would induce direct job growth at the site. In comparison to the Project, the number of construction workers would be substantially reduced because the development at Candlestick Point would be limited to redevelopment of the Alice Griffith Public Housing site. The limited State Parks land agreement would allow for lesser development than the Project, and the San Francisco 49ers stadium would not be constructed. It is anticipated that construction employees would commute from elsewhere in the region, rather than relocate to the Bayview Hunters Point neighborhood for a temporary construction assignment. Thus, construction of this Alternative would not generate a substantial, unplanned population increase. Impacts associated with construction employment would be less than significant.

Implementation of Alternative 3 would induce direct and indirect population growth, but this growth would not be considered substantial. Compared to the Project, which would develop a total of 10,500 residential units, this Alternative would develop 1,210 residential units at Candlestick Point and 4,000 residential units at HPS Phase II, for a total of 5,210 residential units. Employment growth would result in the demand for approximately 7,620 residential units, which would be greater than the total number of units being provided (approximately 7,005 jobs and 5,210 housing units). It is expected that approximately 55 percent of the workers would seek housing in the City (4,191 units). Based on existing commuting patterns, housing demand in other communities is estimated to be 45 percent of total housing demand (3,429 units).[1353] This would result in a surplus of jobs that could lead to an increased demand for housing units and adverse impacts to the Bayview neighborhood or other areas of the City that would not occur under the Project.

Transportation and Circulation

Alternative 3, with reduced development, residential development would be decreased and retail and arena uses would not be developed at Candlestick Point. At HPS Phase II, housing would be increased; other uses at HPS Phase II would be similar to the Project. The new Yosemite Slough bridge serving only transit, bike, and pedestrian traffic would extend Arelious Walker Drive from Candlestick Point to HPS Phase II. This alternative assumes that the 49ers football team would continue to use the existing Candlestick Park stadium.

The Transportation Study analyzed Alternative 3 and conclusions from the Transportation Study are presented below.

Construction Impacts

- Construction activities associated with Alternative 3 would be similar reduced compared to effects with the Project. Localized construction-related traffic impacts would remain significant and unavoidable.

Intersection LOS

Alternative 3 would have reduced project and cumulative effects at some study intersections. Section III.D discusses traffic effects at those intersections, and the feasibility of mitigation measures. In general, intersection conditions would be significant and unavoidable effects of Alternative 3.

Game day traffic conditions would continue to occur at existing Candlestick Park stadium.

Freeway Conditions

Alternative 3 freeway mainline sections effects, freeway ramp junctions conditions, and ramp queuing effects would generally be similar to the Project conditions. Alternative 3 would have reduced effects at the US-101/Alemany northbound on-ramp (LOS E compared to LOS F with the Project); US-101/Alana/Harney/Geneva southbound on-ramp (LOS C compared to LOS F); US-101/Harney northbound on-ramp Sunday PM (LOS D compared to LOS E); US-101/Bayshore/Chavez northbound

[1353] Total employment was estimated using the employment factors presented in Table III.C-7 of this EIR and a total population of 12,239. Based on existing commuting patterns, housing demand in San Francisco is estimated to be 55 percent of total housing demand housing demand in other communities is estimated to be 45 percent of total housing demand.

on-ramp (LOS D compared to LOS F). Queues on the US-101/Harney northbound off-ramp would not extend onto the mainline segment in Sunday PM conditions. Other freeway impacts with Alternative 3 would be significant and unavoidable.

Transit Impacts

Alternative 3 transit conditions assume implementation of Project-related transit improvements. Alternative 3 would have a less than significant impact on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with Alternative 3 would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. As concluded in Section III.D, the transit delay effects would remain significant and unavoidable. During the AM and PM peak hour, Alternative 3 would require 20 additional vehicles on the same routes as the Project, compared to up to 28 vehicles with the Project.

Bicycle Impacts

The Alternative 3 bicycle trips would be accommodated within the proposed street and network; impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The Alternative 3 pedestrian trips would be accommodated within the proposed sidewalk and pedestrian network; impacts on pedestrian circulation would be less than significant.

Parking Impacts

Alternative 3 would result in a demand for about 10,835 spaces, compared with a maximum permitted supply of about 8,990 spaces; therefore, the maximum off-street parking supply would be about 1,845 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Alternative 3 impacts on parking would be less than significant.

This alternative would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

The construction period and intensity associated with implementation of Alternative 3 would be reduced compared to the Project because the only development at Candlestick Point would be redevelopment of the Alice Griffith Public Housing site and the San Francisco 49ers football stadium would not be

constructed at HPS Phase II. Instead, residential and retail uses would be constructed on the stadium site. Additionally, development under Alternative 3 would result in the construction of 5,210 residential units, which is approximately 50 percent less than the Project. However, construction under Alternative 3 would involve similar types of construction activities compared to the Project. Like the Project, those activities would be visible to surrounding land uses and could impact views of scenic vistas and scenic resources in the area. However, any impacts to views would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. The development area of Alternative 3 is substantially reduced compared to the Project, so temporary impacts on scenic vistas would be reduced compared to the Project. Like the Project, construction activities associated with Alternative 3 would have a less-than-significant impact on scenic vistas.

The Project site contains no scenic resources that would be permanently adversely affected by construction activities. As with the Project, construction activities for Alternative 3 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates that would be visible during construction of the utility infrastructure improvements. Although these activities would take place primarily on site, views of the activities could be available from surrounding land uses. As with the Project, implementation of the identified mitigation measure (MM AE-2) would require the Project developer of Alternative 3 to screen construction sites from public view at street level, provide for appropriate staging of construction equipment, and maintain the cleanliness of construction equipment. The San Francisco 49ers stadium would not be constructed. Therefore, the potential impacts of construction activities on the visual character or quality of the site would be less than the Project, and less than significant.

The development area of Alternative 3 would be substantially reduced compared to the Project, with the majority of development occurring at HPS Phase II and no construction of the San Francisco 49ers stadium. Residential and retail uses would be constructed on the stadium site instead. Similar to the Project, construction of Alternative 3 would occur during daylight hours, and, therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass); however, similar to the Project, the glare created by construction activities at the Project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after hours on all construction sites, but this lighting would be minimal, restricted to the Project site, and would not exceed the level of existing night lighting levels in other urban areas of San Francisco. Construction activity under development of Alternative 3 would be less than the Project, therefore, creating less potential for glare impacts. In addition, construction lighting would comply with all City lighting requirements. Therefore, construction activities for development under Alternative 3 would have less-than-significant light and glare impacts, similar to the Project.

Development at HPS Phase II would not substantially block views of scenic vistas, including the Bay. Views of the East Bay and the Bay from HPS Phase II would be maintained on the site and within public access areas, such as from HPS Phase I Hilltop Park. While development of Alternative 3 would include high-rise towers similar to the Project at HPS Phase II, those towers would not substantially obstruct views of the Bay or beyond from any long-range viewpoints. The Yosemite Slough bridge as proposed under the Project would not adversely impact long- or short-range views of the Bay or other scenic vistas. The Yosemite Slough bridge would be constructed with a narrower footprint compared to the Project and would not substantially impact to scenic vistas. Redevelopment of the Alice Griffith Public Housing site

at Candlestick Point would not obstruct scenic vistas because the maximum height of development would be limited to 65 feet. Therefore, similar to the Project, development under Alternative 3 would not substantially obstruct any scenic vistas, and this impact would be less than significant.

Development under Alternative 3 would not substantially damage scenic resources that contribute to a scenic public setting. Scenic resources at HPS Phase II would be retained, including the Re-gunning crane. Shoreline improvements at HPS Phase II would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 3 would not damage or remove any identified scenic resources that contribute to a scenic public setting and the impact would be less than significant.

Development under Alternative 3 would result in fewer changes to the existing visual character of the Project site. In any event, such changes would be the same as for the Project, i.e., conversion of a degraded industrial area and open space to a more developed urban setting, which change would not be considered adverse. Alternative 3 would not substantially degrade the visual character or quality of the Project site area or its surroundings, the same as the Project. In fact, development under Alternative 3 would improve the degraded and deteriorated conditions at the HPS Phase II and Alice Griffith Public Housing sites. Shoreline improvements at HPS Phase II would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 3 would not substantially degrade the visual character or quality of the Project site or its surroundings. The impact would be less than significant, the same as for the Project.

Development under Alternative 3 would increase lighting on the Project site. However, the amount of new lighting would be substantially reduced because none of the Candlestick Point site would be developed with the exception of the Alice Griffith Public Housing. Furthermore, with a limited State Parks land agreement, a smaller portion of State Parks land would be developed; 21 fewer acres than with the Project. The San Francisco 49ers stadium would also not be constructed. Relative to existing outdoor lighting, new building surfaces at the HPS Phase II site and the Alice Griffith Public Housing site would increase the level of illumination in the area. Area lighting would illuminate larger areas that are well traveled so as to promote way finding and provide for a safe environment. In addition to area lighting, building lighting would be angled towards building surfaces for aesthetic purposes and/or to illuminate signs. Like the Project, both types of lighting would be designed to avoid direct visibility of the light source. City Resolution 9212 prohibits the use of highly reflective or mirrored glass in new construction. Implementation of the identified mitigation measures (MM AE-7a.1, MM AE-7a.2, MM AE-7a.3, and MM AE-7a.4) and compliance with City Resolution 9212 would reduce impacts from light and glare to a less-than-significant level by shielding lighting fixtures, minimizing spill light, screening vehicle headlights to the maximum extent feasible, and eliminating or minimizing increased glare by the use of non-reflective glass and non-reflective textured surfaces within the proposed development area. Potential stadium lighting impacts would be avoided because the San Francisco 49ers stadium would not be constructed. Therefore, impacts from light and glare would be less than significant, and somewhat less than with the Project.

With a limited State Parks land agreement, there would be a limited established funding mechanism for future maintenance of the State Parks on site from the Project Applicant. Furthermore, as described in Recreation, below, increased use of the CPSRA as a result of population and employment growth associated with Alternative 3 is anticipated. Therefore, increased use of the CPSRA with only a limited

established mechanism for future maintenance of the CPSRA could result in deterioration of the CPSRA. This could potentially result in a substantial adverse impact on the visual character and quality of the Project site. Without a greater funding mechanism to address the increased use, improvements and maintenance of the CPSRA would be the responsibility of CDPR. Therefore, development of Alternative 3 could result in a new adverse impact to the visual character and quality of the CPSRA, unless a funding mechanism is established. This impact would be greater than for the Project.

Shadows

Development under Alternative 3 would include similar heights, layouts, and orientations of buildings as the Project. However, as discussed above, the development program under Alternative 3 would be reduced. A limited State Parks land agreement would only allow for redevelopment of the Alice Griffith Public Housing site at Candlestick Point along with the bridge approach to the Yosemite Slough. New structures in the Alice Griffith Public Housing site would have maximum heights of 65 feet and Gilman Park would experience no new shading. The CPSRA would be affected by new shade in the afternoon from the Alice Griffith Public Housing site, but new shading would be limited and less than the Project. At HPS Phase II, the existing public open space, India Basin Shoreline Park and India Basin Open Space, would not be affected by new shading from development under Alternative 3. Under Alternative 3, a stadium would not be constructed at HPS Phase II. The extent and duration of shadow on new public sidewalks would increase along street corridors of HPS Phase II and the Alice Griffith Public Housing sites. Similar to the Project, this new shadow would not be in excess of that which would be expected in comparable San Francisco neighborhoods. New shade created by implementation of Alternative 3 would occur at limited times of the day and year, and would not substantially affect the use of outdoor recreational facilities or open space. Similar to the Project, this impact would be less than significant.

Wind

Development at HPS Phase II under Alternative 3 would include tower structures above 100 feet in height, which would extend above surrounding buildings and intercept a large volume of wind. Because of the exposure of tall structures to wind, the tower structures proposed under Alternative 3 would have the potential to accelerate winds in nearby pedestrian sidewalk areas or public open space areas. The degree of change in pedestrian-level wind conditions would be influenced by building design, such as building height, shape, massing, setbacks, and location of pedestrian areas. Structures nearing or over 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 miles per hour for a single hour of the year would be exceeded. Similar to the Project, the street grid at HPS Phase II would not align with predominant west and west-northwest wind directions and would, therefore, not result in channeling of winds along street corridors. The street grid would orient building faces such that they would not face into the prevailing wind direction; that orientation would reduce potentially significant pedestrian-level wind acceleration at the HPS Phase II site. Development of the Alice Griffith Public Housing site would be limited to 65 feet and would, therefore, not affect pedestrian-level wind conditions.

Implementation of the identified mitigation measure (MM W-1a) for development at HPS Phase II would reduce the potential impact from wind for development of Alternative 3 by requiring review of all buildings with potential significant adverse wind impacts by a qualified wind consultant. The *Planning Code* requires that for any such exceedances of the wind hazard criteria would require revised design to reduce the impact below

the established threshold. Implementation of required design changes, if any, would reduce potential hazardous wind effects at the pedestrian level by forcing wind downwash to tops of podium areas and/or into the street and away from pedestrian areas. Compliance with the mitigation measures would ensure pedestrian safety in pedestrian-access areas. Similar to the Project, through implementation of the identified mitigation measure, wind impacts at the HPS Phase II and Alice Griffith sites would be less than significant.

Air Quality

The footprint of development, the total amount of development, and the land uses provided with Alternative 3 would be reduced compared to the Project, Alternative 3 involves limited development at Candlestick Point, and considerably less development would occur at HPS Phase II. No new stadium would be constructed, and the State Parks agreement would not occur. As development would be considerably less than under the Project, the potential air quality impacts would less than the Project.

Construction activities for Alternative 3 would generate dust; however, they would need to comply with the San Francisco Health Code and BAAQMD requirements. Implementation of MM HZ-15, which would require the Applicant to ensure that construction contractors comply with the dust control strategies included in an approved dust control plan as part of a site-specific dust control plan, would reduce the impacts caused by construction dust to a less-than-significant level.

Construction activities could also create DPM; however, as the development of Alternative 3 would be considerably smaller than under the Project, implementation of MM AQ-2.1 and MM AQ-2.2, accelerated emission control implementation on construction equipment, would keep this impact less than significant. Construction activities could also generate TAC containing PM_{10}; however, as construction activities for Alternative 3 would be fewer than for the Project, this impact would be less than significant.

Though operational emissions associated with Alternative 3 would be much lower than with the Project, due to the smaller scale of Alternative 3, the mass emissions would exceed the BAAQMD CEQA thresholds and therefore this impact would remain significant and unavoidable, similar to the Project. Alternative 3 has the same R&D square footage as the Project, therefore potential TAC emissions from facilities in R&D areas would be similar to the Project. With the implementation of MM AQ-6.1 and MM AQ-6.2, this impact would be less than significant, same as the Project.

Additionally, as the scale of Alternative 3 is smaller than the Project, the impacts from Alternative 3 traffic (e.g., carbon monoxide and $PM_{2.5}$) would be less than the Project and less than significant.

According to the current BAAQMD CEQA Guidelines, odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD regards with potential to generate considerable odors include: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries and chemical plants. Alternative 3 would be a large mixed-use development containing residential, office, retail, R&D, recreational, and entertainment uses. Although there may be some potential for small-scale, localized odor issues to emerge around proposed sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely and would be resolved by interventions after receipt of any complaints. This would be a less-than-significant impact, the same as for the Project.

The Project is consistent with regional air quality plans; therefore, as Alternative 3 is smaller than the Project, it would remain consistent with these plans. Alternative 3 promotes the use of alternative transportation modes, such as transit, biking and walking. In addition, it puts housing in close proximity with jobs and retail establishments, reducing the length of trips and further reducing reliance on single-occupancy vehicles. Therefore, Alternative 3 conforms to the regional air quality plan and there would be a less-than-significant impact, the same as for the Project.

Noise

As the footprint of development, the total amount of development, and the land uses provided with Alternative 3 would be reduced compared to the Project, noise impacts of Alternative 4 would be the less than the Project.

Construction activities for Alternative 3 would expose sensitive receptors to increased noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which generally prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction Best Management Practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels, similar to the Project.

Construction activities for Alternative 3 would result in a temporary or periodic increase in ambient noise levels that would be noticeable and likely cause for human annoyance. Construction activities would occur within 25 feet of existing and future residential uses. Pile driving activities could result in substantial noise levels of up to 107 dBA at new residential uses on the site or at adjacent existing residences. Construction-related temporary increases in ambient noise levels would be considered significant and unavoidable, the same as for the Project.

Construction activities for Alternative 3 would create a substantial temporary increase in ambient noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction Best Management Practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of mitigation measures MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction Best Management Practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under Alternative 3, but not to a less-than-significant level as vibration levels from pile driving activities

would be similar to the Project for the residential uses within the HPS North District; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of Alternative 3, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with Alternative 3, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of Alternative 3 would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Although considerably less development would occur under Alternative 3, significant impacts identified for the Project along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, would remain with implementation of Alternative 3. Because the Alternative 3 would not include a football stadium at HPS Phase II and the stadium at Candlestick Point, noise impacts identified for the Project from football games and concerts would not occur with implementation of Alternative 3. Noise generated from the existing stadium is considered an existing condition and would not be considered an impact of the Project.

The Project site is not located within an airport land use plan area or near a private airstrip. Furthermore, Alternative 3 does not include an aviation component. Therefore, Alternative 3 would not result in the exposure of people to excessive aircraft noise levels. Impacts would be less than significant, similar to the Project.

Cultural Resources

Alternative 3 would not change the significance of any historic structures at Candlestick Point because no historic resources have been identified at Candlestick Point. Similar to the Project, implementation of Alternative 3 would retain Drydocks 2 and 3 and rehabilitate Buildings 140, 204, 205, and 207 at the HPS Phase II site in accordance with the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. However, development under Alternative 3 would result in the demolition of Buildings 211, 231, and 253, which are historic resources in the expansion of the Hunters Point Commercial Dry Dock and Naval Shipyard Historic District to include Drydock 4 and contributing buildings. This would result in a significant impact because the proposed actions would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Implementation of the identified mitigation measures (MM CP-1b.1 and MM CP-1b.2) would reduce those impacts; however, the demolition of historic resources would not reduce impacts to a less-than-significant level. Therefore, similar to the Project, the impacts to these historical resources, created by developing Alternative 3, would be a significant and unavoidable.

Construction activities associated with Alternative 3 within the Alice Griffith Public Housing site and HPS Phase II site could result in a substantial adverse change in the significance of archaeological resources. The Project site overall is likely to contain subsurface archaeological resources from the Native American, Chinese fishing village, prehistoric, and maritime development periods. Similar to the Project, construction activities associated with Alternative 3 could disturb those archaeological resources, and result in potentially significant impacts. Implementation of the identified mitigation measure (MM CP-2a) would reduce the effects on archaeological resources to a less-than-significant level.

Construction activities associated with Alternative 3 could result in a substantial adverse change in the significance of paleontological resources. Compared to the Project, these potential impacts would be limited to the HPS Phase II and Alice Griffith Public Housing sites. Under Alternative 3, the development footprint at Candlestick Point would be substantially smaller than the Project and the development footprint at HPS Phase II would be greater than the Project. The Bay mud underlying portions of the fill is likely to contain paleontological resources. Similar to the Project, implementation of the identified mitigation measure (MM CP-3a) would reduce the effects of construction-related activities to potential paleontological resources in in-water and off-site areas to a less-than-significant level for development under Alternative 3.

Hazards and Hazardous Materials

Under Alternative 3, the construction impacts associated with Hazards and Hazardous Materials would be reduced as compared to the Project because the overall development footprint would be smaller. There would be no new development on Candlestick Point, and the new stadium would not be constructed. The Yosemite Slough bridge would have a smaller footprint than with the Project, as it would be designed to accommodate BRT, bicycles, and pedestrians only. This reduced development would result in a smaller area subject to disturbance.

Site preparation would include deep excavations for large structures such as for residential towers, with plans to use the cut material elsewhere within the Project site as fill, trenching for utility lines, dewatering, grading and compaction and other earth-disturbing activities. As portions of the site are known to contain elevated levels of chemicals in the soil, construction activities could result in exposure of construction workers, the public or the environment to unacceptable levels of hazardous materials if not handled appropriately. MM HZ-1a would reduce effects related to exposure of known contaminants at Alice Griffith by requiring compliance with Article 22A or an equivalent process. At HPS Phase II, potential effects related to exposure to hazardous materials from construction activities would be mitigated through requirements to comply with restrictions imposed on the property through the federal site clean-up process (MM HZ-1b, MM HZ-9, and MM HZ-12). Disturbance of contaminated soil would be reduced with elimination of the Yosemite Slough bridge and new stadium, but would still occur. MM HZ-10b would ensure approval of workplans by the Navy and regulatory agencies prior to any work in the shoreline areas. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts from disturbance of contaminated soil, groundwater and sediments.

At both Candlestick Point and HPS Phase II, compliance with MM HZ-2a.1 would require the preparation and implementation of contingency plans to address unknown contaminants that might be encountered during construction, and compliance with MM HZ-2a.2 would require preparation and implementation of health and safety plans to protect construction workers from exposure to hazardous materials during construction activities. Construction activities could require off-site transport of contaminated soil or groundwater; compliance with federal, state, and local regulations would ensure that no unacceptable exposure to chemicals occur as a result of these activities. Further, mitigation measures MM HY-1a.1, MM HY-1a.2, and MM HY-1a.3 would ensure that no unacceptable levels of hazardous materials in soil in surface runoff or in groundwater are discharged to the sewer system or discharged from the site to the Bay. Hazardous materials impacts from all of the above construction-related activities would be reduced to less than significant with the implementation of the mitigation measures identified above, the same as for the Project.

Development under Alternative 3, as for the Project, would require the installation of foundation support piles, which could, under certain soil conditions, create a vertical conduit for chemicals occurring in shallow groundwater to migrate to the deeper groundwater aquifer. However, MM HZ-5a, which requires preparation of a plan for pilot boreholes for each pile to prevent disturbance of potentially contaminated fill materials and would reduce this potential impact from pile driving to less than significant, the same as for the Project.

Elimination of construction of the Yosemite Slough bridge would avoid impacts associated with disturbance of potentially radiologically impacted soils at HPS Phase II in the vicinity of Parcels E and E-2, thus reducing the potential for exposure to hazardous materials in soil or groundwater in this area.

Alternative 3 would place housing on the HPS Phase II site. The Navy's cleanup plan is designed to remediate the HPS site to levels acceptable for the planned uses in the existing HPS Redevelopment Plan. To the extent that Alternative 3 proposes to place housing in areas not designated for residential use in the existing HPS Redevelopment Plan, additional hazardous materials remedial work could be required, which could result in some increased risk to workers, the public and environment from exposure to hazardous materials during the construction process. Any property that has not been remediated for unrestricted use at the time of transfer will have use restrictions placed on the property in compliance with the federal clean-up process. For use restrictions to be removed, the Project Applicant would be required by the transfer documents to obtain approval from the regulatory agencies overseeing the clean-up process before residential uses could be placed on these portions of the site. Any remedial activities undertaken as part of the construction process would be subject to the requirements in MM HZ-1b, which requires construction activities at HPS Phase II to be done in accordance with all restrictions imposed on the site by the federal regulatory clean-up process and these impacts would be less than significant, the same as for the Project.

Potential impacts associated with disturbance of naturally occurring asbestos would be similar to those associated with the Project and would be mitigated through MM HZ-15, which requires the preparation of dust control plans as required by BAAQMD and DPH. Alternative 3 would involve the demolition of existing structures that may contain asbestos-containing building materials, lead-based paint and other hazardous materials, the same as the Project. The existing regulatory framework and approval process would avoid potential hazards from demolition or building preservation activities and impacts would be less than significant, the same as the Project.

Alternative 3 would involve off-site roadway improvements, which could result in disturbance of hazardous material in soil or groundwater. Unacceptable exposures would be controlled as for the Project by implementation of MM HZ-1a, and hazardous materials impacts from these activities would be less than significant.

Project operations would involve routine use, storage, transport, or disposal of hazardous materials. The use of such materials would be the same as for the Project, as the development program is essentially the same. Compliance with applicable federal, state, and local regulations related to the use, storage and transport of such materials would result in a less-than-significant impact from hazardous materials usage, the same as for the Project.

Geology and Soils

Compared to the Project, potential construction-related geology and soils impacts of Alternative 3 would occur as a result of construction activities at the HPS Phase II, Alice Griffith Public Housing, and Yosemite Slough bridge sites. Under Alternative 3, the development footprint at Candlestick Point would be substantially smaller than the Project (limited to only the Alice Griffith Public Housing site and the Yosemite Slough bridge approaches) and the development footprint at HPS Phase II would be greater than the Project. Additionally, because the State Parks land agreement would be limited, less land would be available for development under Alternative 3. The San Francisco 49ers stadium would also not be built under the Alternative.

Construction activities, such as removal of paved areas, grading, and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. This includes construction of the Yosemite Slough bridge. However, requirements to control surface soil erosion during and after construction of Alternative 3 would be implemented through the requirements of the identified mitigation measure (MM HY-1a.1), and adverse effects on the soil such as soil loss from wind erosion and stormwater runoff would be reduced to a less-than-significant level, the same as for the Project

Construction activities would have the potential to affect groundwater levels. Construction may include dewatering procedures during excavation, construction, and operation of foundations and buried utilities. The dewatering could cause settlement of adjacent soils that could damage the overlying foundations of existing buildings. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by the identified mitigation measure (MM GE-2a), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Similar to the Project, settlement hazards related to dewatering would be less than significant for development under Alternative 3.

Development of Alternative 3 would require rock removal activities at the Alice Griffith Public Housing site that could result in damage to structures from vibration or settlement caused by the fracturing of bedrock for excavation. Compared to the Project, Alternative 3 would not require rock removal at the Jamestown district because that area would not be developed. With implementation of the identified mitigation measure (MM GE-3), vibration from controlled rock fragmentation in the area would not cause unacceptable settlement at adjacent or nearby properties. Similar to the Project, settlement hazards related to controlled rock fragmentation would be less than significant for development under Alternative 3.

The potential for exposure to adverse effects caused by seismic groundshaking and seismically induced ground failure such as liquefaction, lateral spreading, landslides and settlement exists at the Project site. The identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, and MM GE-6a) would require design-level geotechnical investigations for development under Alternative 3. Design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of structures, as required by the SFBC through review by DBI. The structural design review would ensure that all necessary mitigation methods and techniques are incorporated in the design for foundations and structures to reduce potential impacts from ground failure or liquefaction to a less-than-significant level for development under Alternative 3, the same as for the Project.

The existing shoreline exhibits active erosion and consists of areas of unprotected slopes and dilapidated naval pier and wharf structures. At HPS Phase II, Alternative 3 would include numerous shoreline improvements, including additional concrete revetments, creation of new beach and tidal habitat, and some grading and importation of fill at certain locations. These improvements would improve the stability of the shoreline. Therefore, Alternative 3 would not result in the exposure of structures and facilities at the HPS Phase II site to substantial adverse effects caused by shoreline instability. Similar to the Project, the impact would be less than significant.

The potential for adverse effects caused by landslides, settlement, expansive and corrosive soils, exists at the HPS Phase II, Alice Griffith Public Housing site, and the Yosemite Slough bridge. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual elements of development for Alternative 3, as specified in the identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, MM GE-6a, MM GE-10a, MM GE-11a) for the Project. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of those mitigation measures, impacts with regards to landslides, settlement, and expansive and corrosive soils would be less than significant. Impacts associated with construction of the stadium would be avoided because the stadium would not be constructed under Alternative 3.

Hydrology and Water Quality

The footprint and amount of development for Alternative 3 would be considerably reduced compared to the Project, because a limited State Parks agreement would occur, the Candlestick Park Stadium would remain, development at Candlestick Point would be limited to the redevelopment of the Alice Griffith Public Housing site and the construction of a reduced number of housing units, and a new stadium at HPS Phase II would not be constructed. The extent of impervious surfaces would also be reduced as less development would occur. As such, impacts from construction and operation of the Alternative 3 would be less than the Project.

With adherence to applicable regulatory requirements, construction activities associated with Alternative 3 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With reduced overall development, impacts would be less than the Project, however mitigation measures proposed under the Project would be still be applicable. With implementation of mitigation measures MM HY-1a.1 (preparation of a Storm Water Pollution Prevention Plan—SWPPP—for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 3 would include excavation for building foundations and underground utilities which could require short-term and/or long-term dewatering of the affected areas. As no extensive underground space is proposed for Alternative 3, the installation of underground building elements and utilities would not substantially alter groundwater levels, similar to the Project. As such, Alternative 3 would not substantially deplete groundwater supplies and would result in a less than

significant impact, similar to the Project. As the total amount of open space under Alternative 3 is reduced compared to the Project, the amount of permeable surface within the Project footprint would also be less. However, a limited State Parks agreement would occur, and existing open space accounted for under the Project would remain. Therefore, Alternative 3 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within Alternative 3 site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of Alternative 3, the existing drainage patterns within the area would generally be preserved. Construction activities associated with Alternative 3 would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 3, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of an SWPPP) impacts would be less than significant, similar to the Project.

Operation of Alternative 3 would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of Alternative 3. In addition, Alternative 3 would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As the extent of impervious surfaces for Alternative 3 would be reduced than the Project, impacts would be less than the Project.

Development under Alternative 3 would also not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of Alternative 3 could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exist at or near the site currently, or result in substantial erosion, siltation, or flooding on or off site similar to the project. Implementation of Alternative 3 would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of Alternative 3 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of Alternative 3 would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, Alternative 3 would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

Compared to the Project, potential construction-related biological resource impacts of Alternative 3 would occur as a result of construction activities at the HPS Phase II, Alice Griffith Public Housing, and Yosemite Slough bridge sites. Under Alternative 3, the development footprint at Candlestick Point would be substantially smaller than the Project (limited to only the Alice Griffith Public Housing site and the Yosemite Slough bridge approaches) and the development footprint at HPS Phase II would be greater than the Project. Additionally, because the State Parks land agreement would be limited, less land would be available for development under Alternative 3. The San Francisco 49ers stadium would also not be built under the Alternative.

Alternative 3 would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt). Alternative 3 would also have the potential to affect designated critical habitat of the green sturgeon and Central California Coast steelhead and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. In addition, activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the MBTA. Where applicable at the HPS Phase II and the Alice Griffith Public Housing sites, Alternative 3 would include implementation of the ecological design features described in the Project's Draft Parks, Open Space, and Habitat Concept Plan that would result in multiple measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the design components would remove invasive species; restore, preserve,

and enhance wetland, aquatic, and grassland habitats; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline. Alternative 3, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-6a.1, MM BI-6a.2, MM BI-6b, MM BI-7b, MM BI-9b, MM BI-18b.1, and MM BI-18b.2) and ecological design features, would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Similar to the Project, this impact would be less than significant after mitigation. However, impacts to such species would be less than the Project since there would be less removal and/or modification of areas that have the potential to contain special-status species.

Development of Alternative 3 could have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, and regulations, or by the CDFG or USFWS. The only sensitive habitats other than wetlands and aquatic habitats are eelgrass and areas designated as EFH. Shoreline improvements, shoreline abutments for the proposed marina and installation of the breakwater at HPS Phase II could have substantial adverse impact to the communities. However, with implementation of the identified mitigation measures (MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12b.1, MM BI-12b.2, MM BI-12b.3, MM BI-18b.1, MM BI-18b.2, MM BI-19b.1, and MM BI-19b.2), the potential impacts of Alternative 3 on sensitive natural communities identified in local or regional plans, policies, and regulations, or by the CDFG, NMFS, or USFWS, would be reduced to a less-than-significant level. Potential impacts to eelgrass beds would be the same as the Project (eelgrass beds are not located near Yosemite Slough), while impacts to EFH would be less than the Project since the footprint of Yosemite Slough bridge would be reduced and, thus, potential impacts to EFH would also be reduced.

Development of the Yosemite Slough bridge under Alternative 3 would have a smaller footprint compared to the Project because the width of the bridge would be narrower, due to automobiles not using the bridge. Therefore, the temporary and permanent adverse effects of Alternative 3 on wetlands and federally protected waters would be reduced compared to the Project. However, as with the Project, Alternative 3 would implement compensatory mitigation for wetland loss. The shoreline improvements at HPS Phase II included Alternative 3 would be similar to the Project and could have substantial temporary and permanent adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. The identified mitigation measures (MM BI-4a.1 and MM BI-4a.2) would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the USACE, SFRWQCB, and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of the identified mitigation measures, the impacts of development under Alternative 3 to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, and somewhat less than the Project because of reduced development.

Development of Alternative 3 could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The Project site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Project site. Implementation of Alternative 3 would place new residential towers along a portion of the San Francisco Bay shoreline at HPS Phase II. Compared to the Project, the amount of towers would be substantially reduced and the strike hazard related to the stadium light towers would be avoided because the stadium would not be constructed. However, the towers at HPS Phase II could potentially increase strike hazards and alter flight paths, interfering with migratory avian flight paths, which would be considered a potentially significant impact to migratory birds. With respect to aquatic species, although migratory fish could continue to move though the open water and Yosemite Slough, the Project site does not contain any substantial migratory fish pathways such as anadromous fish streams. However, construction of breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact eelgrass beds such that productivity and survival of these habitats would be substantially reduced. Similar to the Project, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-20a.1, and MM BI-20a.2), the potential, impacts of Alternative 3 would be reduced to a less-than-significant level because it would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Similar to the Project, Alternative 3 would be required to comply with mitigation measure MM BI-14a to ensure that Project development would not result in conflicts with the City's tree protection ordinances. With implementation of MM BI-14a, Alternative 3 would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant, similar to the Project.

Public Services

Police Protection

During construction of Alternative 3, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. The purpose of a CTMP is to ensure that the impacts of construction on the public domain, in particular with respect to temporary interruptions to vehicular and pedestrian traffic, are considered and addressed. Because Alternative 2 would include the same mitigation as the Project, there would be a similar requirement to prepare a CTMP for Alternative 3 that would address temporary impacts on circulation during construction. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. Construction activities associated with implementation of Alternative 3 also could increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. To ensure adequate site security, mitigation measure MM PS-1 would require the Project Applicant to provide security during construction. Therefore, this impact would be less than significant, the same as for the Project.

Implementation of Alternative 3 would increase resident and employee population at the Project site resulting in a potential increase in the need for 29 additional police personnel to provide a comparable level of service to existing conditions.[1354] This is 24 fewer additional police officers than the Project would require. The SFPD evaluates the need for additional officers by sector, and not station or district needs. While it is unlikely that 29 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development of Alternative 3.

If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 sf could be constructed within the HPS Phase II site, on land designated for community-serving uses. As part of the this Alternative, up to 50,000 gsf of land at the HPS Phase II site would be designated for community-serving uses including a police station. [1355] Construction of a new SFPD facility (counter, storefront, or other configuration) within these community services uses and/or the reconfiguration or expansion of the existing Bayview Station would be funded by the Project Applicant. Similar to the Project, Alternative 3 includes community service use areas, and as construction would be funded by the Project Applicant, the SFPD would maintain acceptable levels of police service. With less overall development under Alternative 3, in comparison to the Project, the potential need for police protection services in general would also be less under Alternative 3. Furthermore, the stadium would also not be constructed under Alternative 3, eliminating the need for increased police services on game days. Therefore, development of this Alternative would not require new or physically altered police facilities beyond the scope of the Project in order to maintain acceptable police services. This impact is considered less than significant, the same as for the Project.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Fire and Emergency Medical Services

Alternative 3 would add 5,210 residential units and substantially increase employment-generating uses, resulting in an employment population of 7,005. The increase in the residential and daytime employment population (for a total population of 19,144, including residential population of 12,139 plus 7,005 employees), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services, although somewhat less compared to the Project because of the alternative's smaller development.

During construction of Alternative 3, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. Construction of a new SFFD facility on land designated for community-serving uses on the HPS Phase II site (where costs would be borne by the Project Applicant) would allow the SFFD to maintain acceptable response times for fire

[1354] The number of required police officers need to meet comparable level of service to existing conditions was determined using the total daytime population of Alternative 3 (residential population of 12,139 plus 7,005 employees) and the ratio of officers to population presented in Table II.O-2 (1:665 officer to population).
[1355] A total of 50,000 gsf of community services space would be developed under Alternative 3 compared to 100,000 gsf proposed under the Project.

protection and emergency medical services. However, with less overall development under Alternative 3, in comparison to the Project, the potential need for fire and emergency medical services in general would also be less under Alternative 3. Furthermore, the stadium would also not be constructed under Alternative 3, eliminating the need for increased fire and emergency medical services on game days. Similar to the Project, construction of 50,000 gsf of community facilities at HPS Phase II, which could include a new SFFD facility, would be included as a component of Alternative 3.[1356] Therefore, development under Alternative 3 would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Schools

A total of approximately 1,058 school-age children would live within the Project site following full build-out of Alternative 3.[1357] Compared to the Project the amount of school-age children that would live within the Project site following full build-out of Alternative 3 would be substantially reduced. While schools in the Project vicinity have approximately 49 percent capacity remaining in the 2008-2009 school year, it is likely that a 12 percent overcapacity of SFUSD as a result of citywide population growth in 2030 would occur. Similar to the Project, the payment of school impact fees pursuant to SB50 would constitute full mitigation for any potential schools impacts. This impact is considered less than significant for development under Alternative 3, the same as for the Project.

Libraries

Construction of Alternative 3 would not result in impacts to the SFPL. No library branches are located on the Project site. All library services would be available to the community throughout the duration of construction. As such, no impact to library services during construction of Alternative 3 would occur.

Residential and nonresidential development associated with Alternative 3 would increase demand for local library services in the Bayview neighborhood, although due to a 50 percent reduction in residential units, this demand for local library services would be less than under the Project. Although this Alternative would result in a direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the Portola, Visitacion Valley, and the Bayview branches would continue to meet the demands of the community. In addition to the three library branches serving Alternative 3, space would be included at HPS Phase II that would be dedicated to library services to supplement the Bayview branch library. As part of Alternative 3, a 1,500-gsf reading room and automated book-lending machines would be integrated into the community retail and public facilities uses. The SFPL branches, and the dedication of space to accommodate library services on the Project site in order to supplement SFPL

[1356] A total of 50,000 gsf of community services space would be developed under Alternative 3 compared to 100,000 gsf proposed under the Project.
[1357] For Alternative 3, 5,210 residential units multiplied by 0.203 SFUSD student generation rate would result in 1,058 students.

branches, would accommodate increased demand from development under this Alternative. No additional library facilities would be required to accommodate development of Alternative 3. Therefore, no new or physically altered library facilities would be required in order to maintain acceptable service ratios and this impact is considered less than significant for development under Alternative 3.

Recreation

Implementation of Alternative 3 would include parks and open space areas similar to the Project at HPS Phase II and within the Alice Griffith district. Alternative 3 would include a limited State Parks land agreement. The agreement would also allow for the redevelopment of the Alice Griffith Public Housing site, including 2.43-acres of State Parks–owned land. Construction activities associated with the proposed parks and recreational facilities are considered part of the overall development footprint. Parks, open space, and recreational facilities at HPS Phase II would consist of approximately 251 acres. The 1.4-acre Alice Griffith Neighborhood Park would also be constructed under this Alternative. In addition, because the State Parks land agreement would be limited to allow the Yosemite Slough bridge to cross CPSRA lands, no CPSRA acreage would be improved. Therefore, construction activities at Candlestick Point would be substantially reduced compared to the Project. Similar to the Project, construction impacts associated with development of new parks and recreational facilities would be less than significant.

At build-out of Alternative 3, the projected population within the HPS Phase II and Alice Griffith Public Housing sites would increase to approximately 12,139 residents, while employment would increase to approximately 7,005 jobs. Compared to the Project, the State Park agreement would not occur so the existing 120.2 acres would remain in the CPSRA, compared to the 23.5-acre reduction under the Project. The increase in population and employment could result in an increase in the use of existing parks, recreational facilities, and open space. During a given phase, however, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual, and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed. Parks and open space at HPS Phase II would include improvements similar to the Project and would help offset the increase in demand created by new residents and employees. The 1.4-acre Alice Griffith Neighborhood Park would serve residents of the Alice Griffith Public Housing site.

With a limited State Parks land agreement, there would be a limited established funding mechanism for future maintenance of the State Parks on site from the Project Applicant. Furthermore, increased use of the CPSRA as a result of population and employment growth associated with Alternative 3 is anticipated. Therefore, increased use of the CPSRA with only a limited established mechanism for future maintenance of the CPSRA could result in deterioration of the CPSRA. This could potentially result in a substantial adverse impact on recreational facilities at the Project site. Without a greater funding mechanism to address the increased use, improvements and maintenance of the CPSRA would be the responsibility of CDPR. Therefore, development of Alternative 3 could result in a new adverse impact on recreational facilities, greater than the less-than-significant impact under the Project.

A windsurfing launch site is located in the CPSRA. Windsurfing could potentially be impacted by the construction of tall structures at Candlestick Point in close proximity to the Bay that affect wind patterns

and direction. Alternative 3 would not include development of any towers at Candlestick Point and windsurfing conditions would not be affected.

Utilities

Water Supply

Alternative 3 would include water infrastructure similar to the Project. Impacts of construction activities associated with this infrastructure, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of water conveyance or treatment infrastructure associated with the Project. The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with the Alternative 3.

Alternative 3 would include less residential and non-residential development compared to the Project. Development at Candlestick Point would only include redevelopment of the Alice Griffith Public Housing site. Alternative 3 would generate a total demand of approximately 0.97 mgd, 0.7 mgd less than the Project. As current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Alternative 3 on water demand would be an increase of approximately 0.67 mgd.[1358] As stated in the Water Supply Assessment provided for the Project, the SFPUC projects that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions (refer to Appendix Q1). Therefore, there would be sufficient water supplies to accommodate the water demand of Alternative 3. This is considered to be a less-than-significant impact. Similar to the Project, implementation of Alternative 3 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant.

Implementation of Alternative 3 would require expansion of the existing off-site AWSS by providing an AWSS loop at Candlestick Point that would connect to the planned extension of the existing off-site AWSS on Gilman Street from Ingalls Street to Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road. Implementation of the identified mitigation measure (MM UT-2) would ensure the provision of adequate water for on-site fire-fighting purposes, and the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact is less than significant with implementation of this mitigation measure.

Wastewater

Under Alternative 3, the Alice Griffith Public Housing site would discharge a maximum peak flow of 186 gpm to the Candlestick tunnel sewer, which has an existing unused capacity of 28,035 gpm in dry weather. This flow would combine with a maximum peak flow of 858 gpm from the HPS Phase II into the Hunters

[1358] Water demand for this alternative was estimated by prorating water demand for the Project (presented in Table III.Q-4) based on build-out of Alternative 3.

Point tunnel sewer. The total maximum peak Project flows of 1,044 gpm (1,414 gpm less than the maximum peak flow of the Project) would combine in the Hunters Point tunnel sewer, which has an existing unused capacity of 69,853 gpm in dry weather.[1359] This represents 1.5 percent of the available capacity of the Hunters Point tunnel sewer, which could be accommodated by the existing off-site infrastructure.

The wastewater generated under Alternative 3 would be 1,414 gpm less than the maximum peak flow of the Project. As with the Project, it is possible that a temporary increase in CSO volume could occur during wet weather if structures are occupied and contribute wastewater to the Combined Sewer System prior to completion of the separate stormwater and wastewater infrastructure of Alternative 3. Implementation of the identified mitigation measure (MM UT-3a) would ensure that there would be no increase in CSO flows as a result of this alternative by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems. The impact on the Combined Sewer System would be reduced to less than significant.

The maximum peak flow of wastewater generated under Alternative 3 would be 1,414 gpm less than the maximum peak flow of the Project. The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the development of Alternative 3. Overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows, assuming completion of utility infrastructure prior to occupancy of Alternative 3. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of the Alternative 3. It is possible that a temporary increase in CSO volume could occur (which could affect the capacity of the SWPCP for treatment) during wet weather, as noted, above. Implementation of the identified mitigation measure (MM UT-3a) would reduce this impact to less than significant by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Alternative 3. Thus, Alternative 3 would not result in any net increase in CSO volume in the Bayside system during wet weather. A less-than-significant impact to existing off-site treatment facilities would occur.

Development associated with Alternative 3 would incrementally contribute wastewater during dry and wet-weather events to the Combined Sewer System operated by the SFPUC, but overall, wet-weather volumes would decrease in the Bayside system with construction of the alternative's separate stormwater and wastewater systems. In addition, the maximum peak flow of wastewater generated under Alternative 3 would be 1,414 gpm less than the maximum peak flow of the Project. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that the Alternative 3 would not exceed the applicable wastewater treatment requirements of the RWQCB. In addition, Alternative 3 would not cause the City to exceed the requirements of the NPDES permit for the reasons previously stated and because the flows during wet weather would actually decline compared to existing flows from the Project site. This impact would be less than significant.

[1359] Wastewater generation for this alternative was estimated by using the generation rates presented in Table III.Q-5 based on build-out of Alternative 3.

Solid Waste

Demolition of existing facilities within the Project site under Alternative 3 would be substantially less than the Project because the only construction and demolition activity at Candlestick Point would occur at the Alice Griffith Public Housing site and the approach to the Yosemite Slough bridge. Candlestick Park stadium would not be demolished. Similar to the Project, some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. With implementation of the identified mitigation measure (MM UT-5a), the Project Applicant would be required to submit a Waste-Diversion Plan demonstrating strategies to divert at least 75 percent of total construction wastes before receiving building permits. This impact would be less than significant.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1360] Under Alternative 3, demolition activities, which generate construction debris, are expected to conclude in 2024 at Candlestick Point and in 2021 at HPS Phase II, a minimum of five years before the landfill is expected to close. Further, the City requires the diversion of at least 65 percent of construction waste, as also required by mitigation measure MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Alternative 3 on solid waste would be further reduced. Under Alternative 3, the only construction and demolition activity at Candlestick Point would occur at the Alice Griffith Public Housing site, the Yosemite Slough bridge approach. The Candlestick Park stadium would not be demolished and substantially less construction waste would be generated. The impact of the construction waste generated by the Alternative 4 on the capacity of the Altamont Landfill would be less than significant.

Construction activities, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. The amount of these materials would be that could be disturbed would be less than the Project because the stadium would not be constructed and the overall development program would be reduced requiring less construction and demolition compared to the Project. Hazardous waste would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently during the construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes. Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. Contaminated soils may require transportation off site and treatment at authorized TSDs. Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of Alternative 3 would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact.

At full build-out, Alternative 3 would generate approximately 9,003.2 tons annually when all uses are fully operational and assuming no waste reduction measures. The amount of solid waste generated under Alternative 3 would be 12,823.8 tons less than the Project because the development program would be substantially reduced. Solid waste generated under Alternative 3 would represent approximately 1.5 percent

[1360] CIWMB, 2009.

(compared to 3.7 percent under the Project) of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons).[1361] All residents and businesses of Alternative 3 would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant would prepare a Site Waste Management Plan as required by the identified mitigation measure (MM UT-7a.1) that would specify the methods by which the Alternative 3 would divert operational solid waste to assist the City in achieving its diversion goals. The impact of operational solid waste generated by Alternative 3 on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Nearly all uses under Alternative 3 would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this time. The use of hazardous materials would be less than the Project because the development program would be reduced. The minimal amount of hazardous waste that would be generated by the Alternative 3 could be accommodated by existing TSD facilities. Similar to the Project, this impact would be less than significant.

Electricity, Natural Gas, and Telecommunications

The proposed utility infrastructure improvements for Alternative 3 would include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications, the same as for the Project. This alternative would not include the new stadium, improvements to the CPSRA, or the full Yosemite Slough bridge. As the development would be smaller than the Project, less electricity, natural gas, and telecommunications serves would be required. Infrastructure expansion would not be as extensive as required for the Project. However, these differences between Alternative 3 and the Project would not substantially affect the infrastructure plan as presented for the Project and, therefore, impacts would be the same as for the Project, and less than significant.

Energy

Construction activities associated with implementation of Alternative 3 would require energy sources including electricity, diesel, and gasoline. Construction activities for would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy and would be subject to requirements to minimize wasteful fuel consumption. Alternative 3 would include much smaller development program compared to the Project, with the majority of development occurring at HPS Phase II, and, therefore, the energy use during the construction period would be substantially reduced. The San Francisco 49ers stadium would also not be constructed, which would substantially reduce energy use at the site over the Project. Furthermore, given the type of development proposed under this Alternative, the energy demand created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related energy use associated with development under Alternative 3 would be considered less than significant.

[1361] Solid waste generation for this alternative was estimated using the solid waste generation rates presented in Table III.Q-8.

Implementation of Alternative 3 would result in baseline electricity consumption substantially less than the Project. In addition, Alternative 3 would include the energy savings associated with the Project Applicant's commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, those efficiency measures would result in consumption of at least 5.4 percent less electricity than a project that would not implement such measures. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts of Alternative 3 to less than significant. The San Francisco 49ers stadium would not be constructed at the HPS Phase II site resulting in a further reduction in electricity demand compared to the Project.

Implementation of Alternative 3 would result in baseline natural gas consumption substantially less than the Project. In addition, Alternative 3 would include efficiency measures similar to the Project resulting in the use of approximately 13 percent less natural gas than a development project without such measures. Those efficiency measures would result in consumption of at least 13 percent less natural gas than a development project without such measures. In addition, the Project Applicant would also implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity, the use of solar thermal energy to provide space cooling with the use of absorption systems, and/or water for space heating and domestic water systems. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential natural gas consumption impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts of Alternative 3 to less than significant. In addition, the San Francisco 49ers stadium would not be constructed at HPS Phase II resulting in reduced natural gas demand compared to the Project.

Alternative 3 would increase trips to and from the Project site, increasing the use of petroleum fuels. However, new trips to the Project site under this Alternative would be substantially less than the Project because the development program would be reduced. Without a stadium at HPS Phase II, game day and event-related fuel consumption would be avoided. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. These programs would be similar to the Project, but would not be as effective because the entire transportation proposed under the Project may not be developed. The transportation system and TDM programs were designed to work for development of Candlestick Point and HPS Phase II as

proposed under the Project. Efficiencies of the system would be reduced compared to the Project because the focus of such improvements would primarily occur at HPS Phase II. However, the Yosemite Slough bridge would serve BRT, bikes and, pedestrians and would result in an overall reduction of automobile trips and petroleum fuel consumption. Similar to the Project, Alternative 3 would not be wasteful with respect to petroleum fuel consumption, and impacts are considered less than significant.

Greenhouse Gas Emissions

Similar to the Project, construction activities associated with implementation of Alternative 3 would emit GHGs associated with diesel and gasoline consumption. Similar to the Project, the construction activities for Alternative 3 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not be a prolonged source of GHG emissions. Alternative 3 would include a much smaller development program compared to the Project, with the majority of development occurring at HPS Phase II, and, therefore, the GHG emissions associated with the construction period would be substantially reduced. The San Francisco 49ers stadium would also not be constructed, which would substantially reduce GHG emissions at the site over the Project. Furthermore, given the type of development proposed under this Alternative, the GHG emissions created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related GHG emissions and climate change associated with development under Alternative 3 would be considered less than significant.

Implementation of Alternative 3 would result in baseline GHG emissions similar to the Project for the HPS Phase II portion, but significantly less at the Candlestick Point portion due to the decrease in the number of dwelling units and absence of commercial uses at Candlestick Point. Alternative 3 would include the GHG emission reductions associated with mitigation measures, including MM GC-1 through MM GC-4, which require the implementation of the Project Applicant's conceptual commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, Alternative 3 would increase trips to and from the Project site, increasing the GHG emissions associated with transportation. However, this Alternative would also include the Project Applicant's commitment to reduce transportation related GHG emissions: (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. These programs would be similar to the Project, but would not be as effective because the entire transportation system proposed under the Project may not be developed. The transportation system and TDM programs were designed to work for development of Candlestick Point and HPS Phase II as proposed under the Project. Efficiencies of the system would be reduced compared to the Project because the focus of such improvements would primarily occur at HPS Phase II. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of GHGs emitted by shortening trip lengths and shifting trips from vehicular modes of travel. Similar to

the Project, those efficiency measures would result in reductions in GHG emissions compared to a project that would not implement such measures. Thus, GHG emissions at the Project site under development of Alternative 3 would not inhibit the achievement of the goals of AB 32 or the SFCAP. Similar to the Project, GHG emissions and climate change impacts would be less than significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for Alternative 3 and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO2e per service population per year and would result in a less-than-significant impact on climate change. Alternative 3 would reduce total development compared to the Project. Alternative 3 would decrease the housing density and alter the service population which would impact the amount of GHG emissions per service population. Without a quantitative analysis, the comparison to the BAAQMD threshold cannot be judged, and Alternative 3 may not be below the proposed threshold.

Attainment of Project Objectives

Alternative 3 would not meet several of the Project objectives entirely because it would include minimal development at Candlestick Point compared to the Project. Alternative 3 would partially meet the remaining Project objectives because it would include a development program for HPS Phase II similar to the Project. Refer to Table VI-6 (Attainment of Project Objectives Alternative 3) below for a discussion of each objective.

Table VI-6 Attainment of Project Objectives Alternative 3

Objective	*Meets Project Objective?*	*Analysis*
1. The integrated development should produce tangible community benefits for the Bayview and the City.	Y–	Alternative 3 would include some community benefits because development would occur at HPS Phase II. However, compared to the Project, Alternative 3 would include substantially less economic development, affordable housing, parks and open space amenities, and improved connection to the existing Bayview neighborhood. Therefore, Alternative 3 would meet this objective to a lesser extent than the Project.
2. The integrated development should re-connect Candlestick Point and the Hunters Point Shipyard site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents.	Y–	Alternative 3 would include a mix of uses and urban design concepts would provide a direct physical, visual, and architectural connection to the Bayview neighborhood and City. However, the majority of development would occur at HPS Phase II. Alternative 3 would include a reduced amount of affordable housing, jobs, and economic opportunities compared to the Project and Alternative 3 would meet this objective to a lesser extent than the Project.
3. The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourages the rebuilding of Alice Griffith Housing.	Y-	Alternative 3 would include a variety of unit types, sizes, and structures, and a wide range of affordability levels. This Alternative would include the redevelopment of the Alice Griffith Public Housing site. Overall there would be a reduced amount of affordable housing units developed under Alternative 3. Therefore, Alternative 3 would not meet this objective to the same extent as the Project.
4. The integrated development should incorporate environmental sustainability concepts and practices.	Y	Although the overall development program would be reduced, Alternative 3 would include similar sustainability principles compared to the Project. Therefore, Alternative 3 would meet this Project objective.
5. The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure.	N	Alternative 3 would not include construction of a new stadium and would not meet this Project objective.
6. The integrated development should be fiscally prudent, with or without a new stadium.	Y–	Development of Alternative 3 would increase sales tax revenue to the City and would include a development program that would encourage substantial private capital investment at the HPS Phase II site. However, the amount of sales tax generating use and potential private investment would be substantially less than the Project and would meet this objective to a lesser extent than the Project.

Y = Alternative does meet Project objective.
Y- = Alternative meets Project objective, but to a lesser extent than the Project.
Y– = Alternative meets Project objective, but to a significantly lesser extent than the Project.
N = Alternative does not meet Project objective.

VI.C.4 Alternative 4: Reduced CP-HPS Phase II Development; Historic Preservation; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge

Summarized Description

Alternative 4 is a reduced-development alternative. A total of 7,350 residential units would be constructed under this alternative, about 30 percent less than proposed with the Project. Consequently, the population growth anticipated under this alternative would be approximately 17,126 compared to approximately 24,465 under the Project. Land uses proposed under Alternative 4 would be similar to those proposed under the Project; however, residential densities and commercial intensities for most uses would be approximately 30 percent less at full build-out in comparison to build-out of the Project. This alternative also includes preservation of four potentially historic structures at HPS Phase II. This alternative would not include construction of a bridge over Yosemite Slough. The State Parks agreement would occur, but no stadium or marina would be constructed. Table VI-7 (Comparison of Alternative 4 and Project Build-Out) provides a comparison of the uses proposed on the Project site under the Project and Alternative 4. Figure VI-3 (Alternative 4 Land Use Plan) illustrates the land use plan for Alternative 4.

Detailed Description

Candlestick Point

New development at Candlestick Point with Alternative 4 would include a 30 percent reduction in residential, retail, hotel, and office uses. A total of 5,495 residential units would be constructed at Candlestick Point at higher densities than the Project, resulting in more mid-rise structures and towers than under the Project. The performance arena and community service uses would remain as proposed under the Project.

HPS Phase II

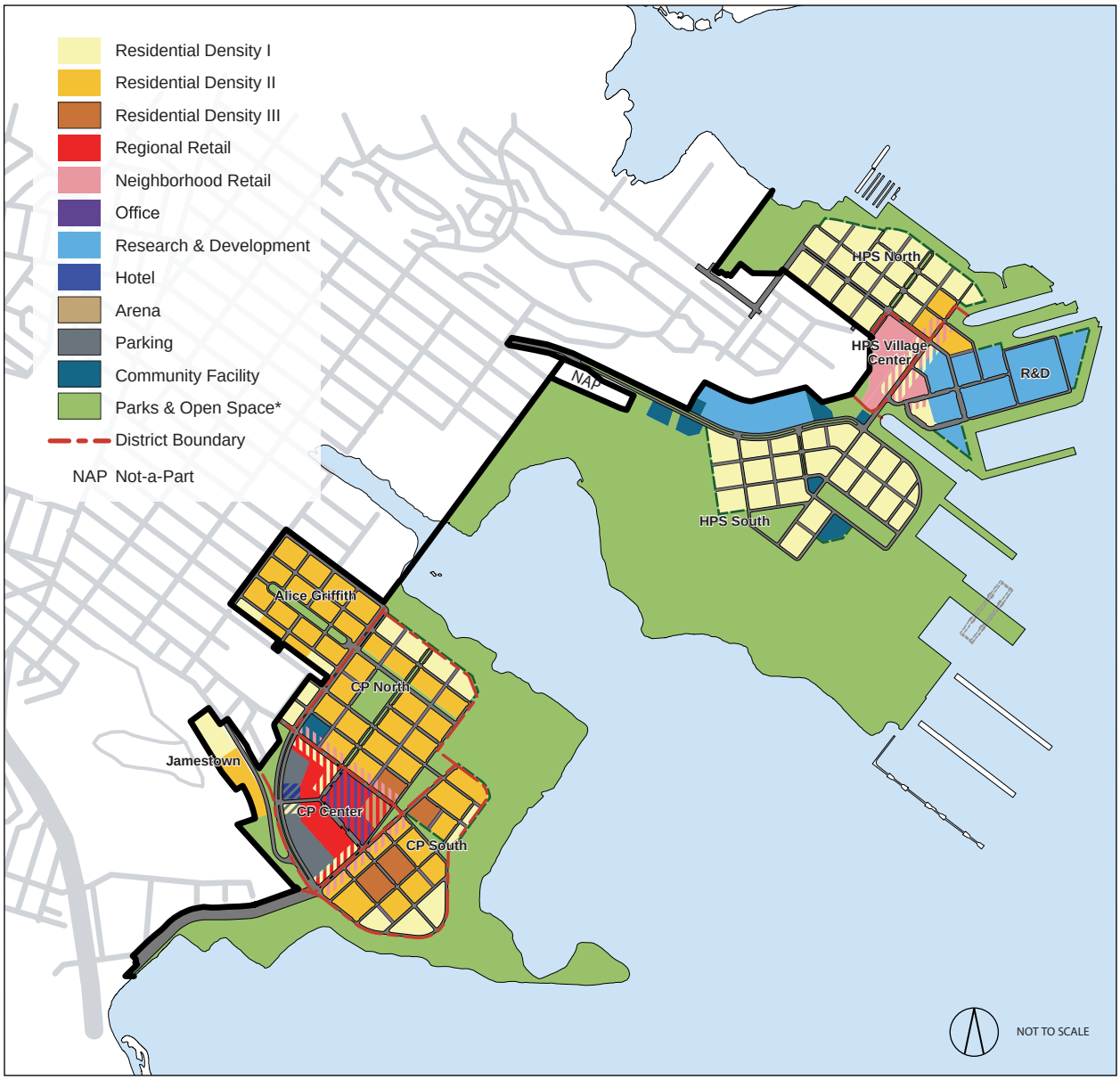
As stated above, retail and R&D floor area would be approximately 30 percent less under this alternative in comparison to the Project. This alternative proposes the expansion of the existing historic district at Drydocks 2 and 3 to include Drydock 4 and Buildings 208, 211, 224, 231, and 253. These buildings would be rehabilitated under Secretary of Interior Standards to accommodate a mix of uses, primarily R&D (refer to Section III.J for more information on Buildings 208, 211, 224, 231, and 253 as historic resources). The buildings occupy approximately 10 acres in the R&D district and would consist of approximately 880,000 gsf of floor area. Housing at HPS Phase II would be reduced by 30 percent. The floor areas for the artists' studios, community services, and performance venue, however, would be the same as for the Project. No stadium or marina would be constructed. No in-water or shoreline improvements associated with a marina would be made.

Table VI-7 Comparison of Alternative 4 and Project Build-Out

Use	*Alternative 4*	*Project*	*Comparison to Project*[a]
Candlestick Point			
Residential (units)	5,495	7,850	-2,355
Retail (gsf):			
Regional Retail	444,500	635,000	-190,500
Neighborhood Retail	87,500	125,000	-37,500
Community Services	50,000	50,000	0
Hotel (gsf)	105,000	150,000	-45,000
Office (gsf)	105,000	150,000	-45,000
10,000-seat Arena (gsf)	75,000	75,000	0
Football stadium (seats)	0	0	0
HPS Phase II			
Residential (units)	1,855	2,650	-795
Neighborhood Retail (gross square feet - gsf)	87,500	125,000	-37,500
Research & Development (gsf)	1,750,000	2,500,000	-750,000
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Community Services	50,000	50,000	0
Football Stadium (seats)	0	69,000	-69,000
Marina (slips)	0	300	-300
Totals			
Residential (units)	7,350	10,500	-3,150
Retail (gsf)	619,500	885,000	-265,500
Community Services	100,000	100,000	0
Research & Development (gsf)	1,750,000	2,500,000	-750,000
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Other Elements			
Yosemite Slough bridge	No	Yes	—
Shoreline Improvements	Yes	Yes	
State Park Agreement/total acres of State Parkland	Yes/96.7	Yes/96.7	0

SOURCE: Lennar Urban, PBS&J, 2009.

a. Community services, arena, artists' space, and football stadium would remain as proposed under the Project.



SOURCE: Lennar Urban, 2009.

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FIGURE VI-3 Candlestick Point — Hunters Point Shipyard Phase II EIR

ALTERNATIVE 4 LAND USE PLAN

Transportation and Circulation (without Yosemite Slough Bridge)

Under Alternative 4, motorized and non-motorized traffic, including BRT, would be required to circumnavigate Yosemite Slough. The circulation network around Yosemite Slough would be the same as for Alternative 2, as illustrated in Figure VI-1. The primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas Avenue to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.

Between the intersection of Carroll Avenue/Arelious Walker Drive and Crisp Road within HPS Phase II, the proposed BRT line would be routed on Carroll Avenue between Arelious Walker Drive and Hawes Street; on Hawes Street between Carroll Avenue and Armstrong Avenue (currently unimproved); and on Armstrong Avenue between Hawes Street and the Navy rail right-of-way; along the Navy rail right-of-way between Armstrong Avenue and Shafter Avenue; along Shafter Avenue between the Navy rail right-of-way and Arelious Walker Drive; and on Arelious Walker Drive between Shafter Avenue and Crisp Road (currently unimproved).

On Carroll Avenue, Hawes Street, and Armstrong Avenue to the Navy rail right-of-way the BRT line would operate within an exclusive BRT lane, one of the two travel lanes in each direction would be transit-only. Hawes Avenue between Carroll Avenue and Armstrong Avenue, and Arelious Walker Drive between Shafter Avenue and Crisp Road are currently unimproved streets and would be built out to accommodate one transit-only travel lane in each direction. The Navy rail right-of-way between Armstrong Avenue and Shafter Avenue would be improved to provide one transit-only travel lane in each direction. Shafter Avenue between the rail right-of-way and Arelious Walker Drive would be reconfigured to provide four travel lanes, with BRT operating in the center lanes.

Basis for Impact Analysis

The potential impacts of Alternative 4 are generally based on the parameters of the Project, which include reduced size, bulk, and type of development. For Alternative 4, the impacts of the Project are compared to the impacts of a similar mix of land uses and improvements, except for the following:

- The Yosemite Slough bridge would not be constructed
- Approximately 30 percent fewer residential units would be developed at Candlestick Point and HPS Phase II (a reduction of 3,150 units) for a total of 7,350 units
- An approximate 30 percent reduction in non-residential uses at Candlestick Point and HPS Phase II, excluding community services, arena capacity, and artist space
- Potential historic resources at HPS Phase II would not be demolished
- The marina and stadium at HPS Phase II would not be constructed

The footprint of development at Candlestick Point would be reduced in comparison to the Project. The footprint of development at HPS Phase II would also be smaller compared to the Project, as the stadium would not be constructed. The overall development program would be reduced, with a total of 7,350 residential units

constructed under this alternative, approximately 30 percent less than proposed with the Project. Non-residential land uses would also be reduced by approximately 30 percent with the exception of community service uses and artist space. No marina and related shoreline and in-water improvements would be made.

Potential Impacts

Land Use and Plans

Implementation of Alternative 4 would require amendments similar to the Project for the following planning documents: *City of San Francisco General Plan*, *Bayview Hunters Point Redevelopment Plan*, *Hunters Point Shipyard Redevelopment Plan*, Bay Plan, and *San Francisco Bay Area Seaport Plan*. An amendment to the *CPSRA General Plan* would not be required because there would no State Parks land agreement. With implementation of the requirements and mitigation measures identified for the Project in Section III.C through Section III.S of this EIR, development under Alternative 4 would not conflict with any applicable land use plans, policies, or regulations (of an agency with jurisdiction) adopted for the purpose of avoiding or mitigating an environmental effect. Furthermore, development under this Alternative would not conflict with any of the policies, goals, and strategies analyzed for the Project. Although the Project is consistent with the Bay Plan polices with regards to Bay fill, it should be noted that development under Alternative 4 would reduce the amount of Bay fill compared to the Project, because the Yosemite Slough bridge and marina would not be constructed. Similar to the Project, this impact would be less than significant.

Implementation of Alternative 4 would not result in a substantial adverse change in the existing land use character. Development under Alternative 4 would substantially change the character of the site from open space and industrial uses to an urbanized area representative of other areas in San Francisco. This change would improve deteriorated conditions and connectivity, as well as provide numerous areas of open space, extensive landscaped areas, and pleasing architecture, all of which would improve the character of the site. Furthermore, with a 30 percent reduction in residential and most non-residential development, no Yosemite Slough bridge, stadium or marina, the changes to the existing land use character would be less substantial than those created by the Project. Therefore, changes resulting from development under Alternative 4 would not be considered adverse. Furthermore, the transition in scale between adjacent neighborhoods and development under this Alternative, as well as the varied range of proposed uses, would not represent a substantial adverse change in the existing land use character of the Project area. Similar to the Project, this impact would be less than significant.

Population, Housing, and Employment

Construction activities associated with implementation of Alternative 4 would induce direct job growth at the Project site. The number of construction workers that would be employed during the construction period would be reduced compared to the Project because less residential and non-residential development would occur, and construction of the Yosemite Slough bridge, stadium, and marina at HPS Phase II would not occur. It is anticipated that construction employees would commute from elsewhere in the region, rather than relocate to the Bayview Hunters Point neighborhood for a temporary construction assignment. Thus, construction under this Alternative would not generate a substantial, unplanned population increase. Direct and indirect impacts associated with construction employment would be less than significant.

Implementation of Alternative 4 would induce direct and indirect population growth, but this growth would not be considered substantial. Compared to the Project, development under this Alternative would result in 5,495 housing units at Candlestick Point and 1,855 units at HPS Phase II, for a total of 7,350 new housing units at the Project site. The jobs and housing units that would be provided at the site would be closely balanced (approximately 7,219 jobs and 7,350 housing units) so that neither a surplus of housing nor jobs would occur, resulting in indirect residential or employment growth. Housing demand based on employment under Alternative 4 (at 0.74 dwelling units per worker) would total 5,608 dwelling units. Housing provided under Alternative 4 would be greater than the employment-generated demand. Based on existing commuting patterns, housing demand in other communities is estimated to be 45 percent of total housing demand (3,249 units).[1362] Approximately 55 percent of the workers would seek housing in the City (3,970 units). As a result, similar to the Project, the population and employment increase associated with development under Alternative 4 would not be substantial. This impact is considered less than significant.

Transportation and Circulation

Alternative 4, with reduced development at Candlestick Point, residential development and regional retail uses would be decreased and arena uses would not be developed. At HPS Phase II, uses would be decreased. This alternative assumes that the 49ers football team would continue to use the existing Candlestick Park stadium. There would be no Yosemite Slough bridge.

The Transportation Study analyzed Alternative 4 and conclusions from the Transportation Study have been presented below.

Construction Impacts

- Construction activities associated with Alternative 4 would be similar reduced compared to effects with the Project. Localized construction-related traffic impacts would remain significant and unavoidable.

Intersection Conditions

Alternative 4 would have reduced project and cumulative effects at some study intersections. Section III.D discusses traffic effects at those intersections, and the feasibility of mitigation measures. In general, intersection conditions would be significant and unavoidable effects of Alternative 4.

Game day traffic conditions would continue to occur at existing Candlestick Park stadium.

Freeway Conditions

Alternative 4 freeway mainline sections effects, freeway ramp junctions conditions, and ramp queuing effects would generally be similar to the Project conditions. Alternative 4 would have reduced effects at the US-101/Harney northbound on-ramp Sunday PM (LOS D compared to LOS E with the Project); US-101/Bayshore/Chavez northbound on-ramp (Sunday PM LOS D compared to LOS F). Queues on the US-101/Harney northbound off-ramp would not extend onto the mainline segment in Sunday PM conditions. Other freeway impacts with Alternative 4 would be significant and unavoidable.

[1362] Total employment was estimated using the employment factors presented in Table II.C-7 of this EIR and a total population of 17,126. Based on existing commuting patterns, housing demand in San Francisco is estimated to be 55 percent of total housing demand housing demand in other communities is estimated to be 45 percent of total housing demand.

Transit Impacts

Alternative 4 transit conditions assume implementation of Project-related transit improvements. Alternative 4 would have a less than significant impact on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with Alternative 4 would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. As concluded in Section III.D, the transit delay effects would remain significant and unavoidable. During the AM and PM peak hour, Alternative 4 would require up to 28 additional vehicles, the same as with the Project.

Although the alternative BRT route around Yosemite Slough would be technically feasible, it would not be an optimal configuration for a BRT system. BRT service would provide direct, fast, and reliable travel in a dedicated right-of-way, typically with signal priority for VRT vehicles. When these elements are combined, the BRT service takes on a higher quality character than typical local bus service. The Yosemite Slough bridge would provide a dedicated right-of-way and most direct route between Hunters Point Shipyard and points to the west, including Candlestick point, the Bayshore Caltrain Station, and Balboa Park BART. Alternative 4 would not accommodate the BRT route on the bridge proposed with the Project.

Bicycle Impacts

The Alternative 4 bicycle trips would be accommodated within the proposed street and network, although there would not be a Yosemite Slough bicycle and pedestrian route; impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The Alternative 4 pedestrian trips would be accommodated within the proposed sidewalk and pedestrian network, although there would not be a Yosemite Slough bicycle and pedestrian route; impacts on pedestrian circulation would be less than significant.

Parking Impacts

Alternative 4 would result in a demand for about 16,750 spaces, compared with a maximum permitted supply of about 13,040 spaces; therefore, the maximum off-street parking supply would be about 3,710 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Alternative 4 impacts on parking would be less than significant.

This alternative would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

Construction activities associated with implementation of Alternative 4 would occur during a similar build-out period and involve similar activities as the Project. Like the Project, those activities would be visible to surrounding land uses and could impact views of scenic vistas and scenic resources in the area. However, any impacts to views would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Mitigation for the Project would also be implemented with this alternative that would reduce visual construction impacts to less than significant. Therefore, impacts to scenic vistas during construction of Alternative 4 would be the same as under the Project, and less than significant. Construction activities associated with Alternative 4 would not result in adverse effects on any scenic vistas and the impact would be less than significant, the same as for the Project.

There are no scenic resources on the Project site that would be permanently adversely affected by construction of Alternative 4. The Yosemite Slough bridge, stadium, and marina would not be constructed as part of Alternative 4, and temporary impacts to the slough and Bay as scenic resources would be avoided. Therefore, impacts to views of scenic vistas during construction of Alternative 4 would be less than the Project. Construction activities associated with Alternative 4 would have a less-than-significant impact on scenic resources.

As with the Project, construction activities for Alternative 4 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates that would be visible during construction of the utility infrastructure improvements. Although these activities would take place primarily on site, views of the activities could be available from surrounding land uses. As with the Project, implementation of the identified mitigation measure (MM AE-2) would require the Project developer of Alternative 4 to screen construction sites from public view at street level, provide for appropriate staging of construction equipment, and maintain the cleanliness of construction equipment. Furthermore, without the construction of the Yosemite Slough bridge, marina, or stadium, the number and duration of construction sites under development of Alternative 4 would be less than the Project. Since less development would occur, Alternative 4 would have a reduced construction impact compared to the Project on the visual character or quality of the site and impacts would be less than significant.

Construction of Alternative 4 would occur during daylight hours, and, therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass); however, similar to the Project, the glare created by construction activities at the Project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the Project site, and would not exceed the level of existing night lighting levels in other urban areas in San Francisco. Furthermore, compared to the Project, approximately 30 percent fewer residential units would be constructed, and construction of the Yosemite Slough bridge, stadium, and marina would not occur. Therefore, construction activity under development of Alternative 4 would be less than the Project, creating less potential for glare impacts. In addition, similar to the Project, construction lighting

would comply with all City lighting requirements. Therefore, construction activities for development under Alternative 4 would have less-than-significant light and glare impacts.

Vertical development under Alternative 4 would have a reduced bulk and mass compared to the Project. Alternative 4 would include four towers at Candlestick Point, compared to 11 towers with the Project, and the average tower height would be similar under Alternative 4. There would be no towers at HPS Phase II.[1363] Alternative 4 would change views of the Project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. This Alternative would have a lesser degree of impacts than the Project in relation to scenic vistas because the Yosemite Slough bridge, the stadium, and the marina would not be constructed. Similar to the Project, development of the Project would not block publicly accessible views of the Bay or other scenic vistas. Views of the East Bay and the Bay from the Project site would be maintained within public access areas, as well as at City and State parks located within Candlestick Point. Additionally, such views from HPS Phase II would be maintained on the site and within public access areas, such as from HPS Phase I Hilltop Park. While development of Alternative 4 would include high-rise towers at Candlestick Point, those towers would be shorter compared to the Project, and because they would not be clustered together, the development would not substantially obstruct views of the Bay or beyond from any long-range viewpoints. The visually prominent new stadium would not appear on the HPS Phase II site. Therefore, similar to the Project, development under Alternative 4 would not substantially obstruct any scenic vistas, and this impact would be less than significant. This impact would be less than under the Project, however, because of the removal of several towers.

Vertical development under Alternative 4 would have a reduced bulk and mass compared to the Project, as described above, due to the 30 percent reduction in residential units and most non-residential uses throughout the Project site. Alternative 4 would also not include construction of the Yosemite Slough bridge stadium, or the marina. Development under Alternative 4 would not substantially damage scenic resources that contribute to a scenic public setting. Alternative 4 would include redevelopment of the Park stadium area and associated paved and unpaved parking lots by replacing degraded urban areas and outdated residential development with new, well-designed urban development and integrated public parks. The Yosemite Slough bridge and roadway approaches would also not be constructed and the appearance of the slough would be unchanged. Scenic resources at HPS Phase II would be retained, including the Re-gunning crane. Shoreline improvements at Candlestick Point and HPS Phase II would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 4 would not damage or remove any identified scenic resources that contribute to a scenic public setting and the impact would be less than significant.

Alternative 4 would result in a reduced development program compared to the Project, with a 30 percent reduction in residential uses and most non-residential uses and no development of the Yosemite Slough bridge, stadium, or marina. Alternative 4 would change the visual character of the Project site. However, similar to the Project, Alternative 4 would not substantially degrade the visual character or quality of the Project site area or its surroundings. In fact, development under Alternative 4 would improve the degraded and deteriorated condition of much of the Project site. Development under Alternative 4 would replace the existing conditions with a more dense urban setting, and would not represent an adverse change. The

[1363] The average tower height at Candlestick Point was estimated to be similar to the Project, due to the 30 percent reduction in residential units and most non-residential uses and the reduced development footprint at Candlestick Point.

proposed shoreline improvements would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 4 would not substantially degrade the visual character or quality of the Project site or its surroundings. The impact would be less than significant.

- Development under Alternative 4 would increase lighting on the Project site relative to existing outdoor lighting, and new building surfaces would increase the level of illumination in the area. However, vertical development under Alternative 4 would have a reduced bulk and mass compared to the Project due to the 30 percent reduction in residential uses and most non-residential uses. Nighttime lighting would be reduced compared to the Project as a result of the reduced development potential and because lighting for the marina, stadium, and CPSRA improvements would not be installed. Therefore, lighting and glare impacts would be reduced compared to the Project and the lighting impact from the stadium, although less than significant for the Project, would be eliminated under this alternative. Area lighting would illuminate larger areas that are well traveled so as to promote way finding and provide for a safe environment. In addition to area lighting, building lighting would be angled towards building surfaces for aesthetic purposes and/or to illuminate signs. Like the Project, both types of lighting would be designed to avoid direct visibility of the light source. Resolution 9212 prohibits the use of highly reflective or mirrored glass in new construction. Implementation of the identified mitigation measures (MM AE-7a.1, MM AE-7a.2, MM AE-7a.3, and MM AE-7a.4) and compliance with Resolution 9212 would reduce impacts from light and glare to a less-than-significant level by shielding lighting fixtures, minimizing spill light, screening vehicle headlights to the maximum extent feasible, and eliminating or minimizing increased glare by the use of non-reflective glass and non-reflective textured surfaces within the proposed development area. Impacts would be less than significant under Alternative 4.

Shadows

- Vertical development under Alternative 4 would have a reduced bulk and mass compared to the Project. Alternative 4 would include four towers at Candlestick Point, compared to 11 towers with the Project, and the average tower height would be similar under Alternative 4. There would be no towers at HPS Phase II.[1364] The stadium would not be constructed. The buildings developed under Alternative 4 would include a similar layout and orientation compared to the Project. At Candlestick Point, the existing public open space, Bayview Park and Gilman Park, would not be affected by new shading from development under Alternative 4. Gilman Park would experience some shading on winter afternoons. Those shadows would be cast by buildings that do not exceed 40 feet in height, are not subject to *Planning Code* Section 295, and, therefore, would not be considered an adverse impact. Some new shadows would be cast on Bayview Park; these would have a less-than-significant effect on that park.

The CPSRA would be affected by new shade in the afternoon but most areas would experience limited to no new shadow from development under Alternative 4. Fewer shadows would be cast in the CPSRA compared to the Project because the adjacent development would have reduced bulk and mass compared to the Project. At HPS Phase II, the existing public open space, India Basin Shoreline Park and India Basin Open Space, would not be affected by new shading from development under Alternative 4. New shadows

[1364] The average tower height at Candlestick Point was estimated to be similar to the Project, due to the 30 percent reduction in residential units and most non-residential uses and the reduced development footprint at Candlestick Point.

cast by development under Alternative 4 on proposed new parks throughout the year would range from little or no shading to large areas of certain parks receiving new shade, particularly in the late afternoon during the vernal and autumnal equinoxes. The extent and duration of shadow on new public sidewalks would increase along street corridors of Alternative 4. Compared to the Project, this new shadow would be reduced and not exceed that which would be expected in a more urban area. New shade created by implementation of Alternative 4 would occur at limited times of the day and year, and would not substantially affect the use of outdoor recreational facilities or open space. Since less overall development would occur under Alternative 4, shade and shadow impacts would be of a lesser degree than the Project, and this impact would be less than significant.

Wind

Development under Alternative 4 would include only four tower structures at Candlestick Point and no tower structures at HPS Phase II. In addition, the 156-foot tall stadium would not be constructed. The remaining towers on Candlestick Point would have a similar average height to the Project towers, which would extend above surrounding buildings and intercept a large volume of wind. Because of the exposure of tall structures to wind, the tower structures proposed under Alternative 4 would have the potential to accelerate winds in nearby pedestrian sidewalk areas or public open space areas. The degree of change in pedestrian-level wind conditions would be influenced by building design, such as building height, shape, massing, setbacks, and location of pedestrian areas. Structures nearing or over 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 miles per hour for a single hour of the year would be exceeded. Similar to the Project, the street grid of Alternative 4 would not align with predominant west and west-northwest wind directions and would, therefore, not result in channeling of winds along street corridors. The street grid would orient building faces such that they would not face into the prevailing wind direction; that orientation would reduce potentially significant pedestrian-level wind acceleration at the Project site.

Implementation of the identified mitigation measure (MM W-1a) would reduce the potential impact from wind for development of Alternative 4 by requiring review of all buildings that could result in adverse wind impacts by a qualified wind consultant. If the review determines that would be any exceedances of the wind hazard criteria, the design must be revised to reduce the impact below the established threshold. Implementation of required design changes, if any, would reduce potential hazardous wind effects at the pedestrian level by forcing wind downwash to tops of podium areas and/or into the street and away from pedestrian areas. Compliance with the mitigation measures would ensure pedestrian safety in pedestrian-access areas. Similar to the Project, through implementation of the identified mitigation measure, wind impacts would be less than significant. Elimination of the bridge, several towers, and the stadium would reduce the potential for adverse wind effects at street level compared to the Project. However, the Project includes mitigation measures that reduce this impact to less than significant. The impact of Alternative 4 would be less than significant, and somewhat less than the Project.

Air Quality

As the footprint of development, the total amount of development, and the land uses provided with Alternative 4 would be reduced compared to the Project, air quality impacts of Alternative 4 would be less than the Project.

Construction activities for Alternative 4 would generate dust; however, they would need to comply with the San Francisco Health Code and BAAQMD requirements. Implementation of MM HZ-15, which would require the Applicant to ensure that construction contractors comply with the dust control strategies included in an approved dust control plan as part of a site-specific dust control plan, would reduce the impacts caused by construction dust to a less-than-significant level.

Construction activities could also create DPM; however, as the development of Alternative 4 would be considerably less than under the Project, implementation of MM AQ-2.1 and MM AQ-2.2, accelerated emission control implementation on construction equipment, would keep this impact less than significant. Construction activities could also generate TAC-containing PM_{10}; however, as construction activities for Alternative 4 would be fewer than for the Project, this impact would be less than significant.

Though operational emissions associated with Alternative 4 would be much lower than with the Project, due to the scale of Alternative 4, the mass emissions would exceed the BAAQMD CEQA thresholds and this impact would remain significant and unavoidable, similar to the Project. Alternative 4 has reduced R&D square footage, and potential TAC emissions from facilities in R&D areas would also be reduced. With the implementation of MM AQ-6.1 and MM AQ-6.2, this impact would be less than significant, and less than the Project.

Additionally, as the scale of Alternative 4 is smaller than the Project, the impacts from Alternative 4 traffic (e.g., carbon monoxide and $PM_{2.5}$) would be less than the Project and therefore continue to be less than significant.

According to the current BAAQMD CEQA Guidelines, odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD regards with potential to generate considerable odors include: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries and chemical plants. Alternative 4 would be a large mixed-use development containing residential, office, retail, R&D, recreational, and entertainment uses. Although there may be some potential for small-scale, localized odor issues to emerge around proposed sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely and would be resolved by interventions after receipt of any complaints. This would be a less-than-significant impact. No mitigation is required.

The Project is consistent with regional air quality plans. As Alternative 4 would be smaller than the Project, Alternative 4 would be consistent with these plans. Alternative 4 promotes the use of alternative transportation modes, such as transit, biking and walking. In addition, it puts housing in close proximity with jobs and retail establishments, reducing the length of trips and further reducing reliance on single-occupancy vehicles. Therefore, Alternative 4 conforms to the regional air quality plan and there would be a less-than-significant impact. No mitigation is required.

Noise

As the footprint of development, the total amount of development, and the land uses provided with Alternative 4 would be reduced compared to the Project, noise impacts of Alternative 4 would be the less than the Project.

Construction activities for Alternative 4 would expose sensitive receptors to increased noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which generally prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction Best Management Practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels, similar to the Project.

Construction activities for Alternative 4 would result in a temporary or periodic increase in ambient noise levels that would be noticeable and likely cause for human annoyance. Construction activities would occur within 25 feet of existing and future residential uses. Pile driving activities could result in substantial noise levels of up to 107 dBA at new residential uses on the site or at adjacent existing residences. Construction-related temporary increases in ambient noise levels would be considered significant and unavoidable, the same as for the Project.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of mitigation measures MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction Best Management Practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under Alternative 4, but not to a less-than-significant level, as vibration levels from pile driving activities would be similar to the Project for the residential uses within the HPS North District; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of Alternative 4, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with Alternative 4, such as truck deliveries, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of Alternative 4 would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Although approximately 30 percent less development would occur under Alternative 4, significant impacts identified for the Project along Carroll Avenue, Gilman Avenue, and Jamestown Avenue would remain with implementation of Alternative 4.

Because Alternative 4 would not include a football stadium at HPS Phase II and the stadium at Candlestick Point, noise impacts identified for the Project from football games and concerts would not occur with implementation of Alternative 4.

Cultural Resources

- Compared to the Project, development under Alternative 4 would not result in the demolition of Buildings 211, 224, 231, and 253, which are potential historic resources in the CRHR-eligible Hunters Point

Commercial Dry Dock and Naval Shipyard Historic District (refer to Appendix V1 [Page & Turnbull Feasibility Report]). The buildings occupy approximately 10 acres in the R&D district and would consist of approximately 880,000 gsf of floor area. Building 208 would be mothballed, the same as under the Project. Building 231 would be rehabilitated to accommodate parking and Buildings 211 and 253 would be rehabilitated to accommodate R&D uses (refer to Appendix V1 [Page & Turnbull Hunters Point Shipyard Feasibility Study, Revised September 9, 2009]). Implementation of Alternative 4 would retain Drydocks 2 and 3 and rehabilitate Buildings 140, 204, 205, and 207 at the HPS Phase II site in accordance with the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Therefore, the impacts of developing Alternative 4 on these historical resources would be less than significant and would avoid the significant impact of the Project on historic resources.

Similar to the Project, construction activities associated with Alternative 4 could result in a substantial adverse change in the significance of archaeological resources, as the Project site is likely to contain subsurface archaeological resources from the Native American, Chinese fishing village, prehistoric, and maritime development periods. Implementation of the identified mitigation measure (MM CP-2a) would reduce the effects on archaeological resources to a less-than-significant level for development under Alternative 4. The Yosemite Slough bridge, marina, and stadium would be eliminated, and potential disturbance of archaeological resources resulting from construction of these components would be avoided, although the Project would mitigate this potential impact to less than significant. Overall, the impacts would be less than significant, and substantially similar to the impacts of the Project.

Construction activities associated with Alternative 4 could result in a substantial adverse change in the significance of paleontological resources. The Bay mud underlying portions of the fill is expected to contain paleontological resources, and there is a possibility of fossils being discovered during construction-related excavation associated with the shoreline improvements. Potential impacts related to construction of the Yosemite Slough bridge, stadium, and marina would be avoided under this Alternative, because these improvements would not be constructed. Similar to the Project, implementation of the identified mitigation measure (MM CP-3a) would reduce the effects of construction-related activities to potential paleontological resources in in-water and off-site areas to a less-than-significant level for development under Alternative 4.

Hazards and Hazardous Materials

Under Alternative 4, the construction impacts associated with Hazards and Hazardous Materials would be somewhat reduced as compared to the Project because the overall development footprint would be reduced, including the elimination of the Yosemite Slough Bridge, marina, and stadium, resulting in a smaller area subject to disturbance. The preservation of historic buildings in HPS Phase II would also result in less subsurface disturbance in that portion of the site. Further, the 30 percent reduction in residential and most non-residential uses and absence of the marina would reduce the risk of exposure to hazardous materials during Project operation.

The development proposed under Alternative 4, while reduced in density, would result in the same development footprint at Candlestick Point and construction-related impacts at Candlestick Point for Alternative 4 would be the same as for the Project. At HPS Phase II, the development footprint would be somewhat reduced, resulting in a comparable reduction in the potential for exposure to hazardous materials during construction as compared to the Project.

Site preparation would still include deep excavations for large structures such as for residential towers, with plans to use the cut material elsewhere within the Project site as fill, trenching for utility lines, dewatering, grading and compaction and other earth-disturbing activities. As portions of the site are known to contain elevated levels of chemicals in the soil, construction activities could result in exposure of construction workers, the public or the environment to unacceptable levels of hazardous materials if not handled appropriately. MM HZ-1a would reduce effects related to exposure of known contaminants at Candlestick Point by requiring compliance with Article 22A or an equivalent process. At HPS Phase II, potential effects related to exposure to hazardous materials from construction activities would be mitigated through requirements to comply with restrictions imposed on the property through the federal site clean-up process (MM HZ-1b, MM HZ-9, and MM HZ-12). Disturbance of contaminated soil, sediments, and groundwater in the shoreline areas at HPS Phase II, although reduced in scope with the elimination of the marina and the Yosemite Slough Bridge, would still occur as a result of shoreline improvements. As for the Project, MM HZ-10b would ensure approval of workplans by the Navy and regulatory agencies prior to any work in the shoreline areas. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts from disturbance of contaminated soil, groundwater and sediments.

At both Candlestick Point and HPS Phase II, compliance with MM HZ-2a.1 would require the preparation and implementation of contingency plans to address unknown contaminants that might be encountered during construction, and compliance with MM HZ-2a.2 would require preparation and implementation of health and safety plans to protect construction workers from exposure to hazardous materials during construction activities. Construction activities could require off-site transport of contaminated soil or groundwater; compliance with federal, state, and local regulations would ensure that no unacceptable exposure to chemicals occur as a result of these activities. Further, mitigation measures MM HY-1a.1, MM HY-1a.2, and MM HY-1a.3 would ensure that no unacceptable levels of hazardous materials in soil in surface runoff or in groundwater are discharged to the sewer system or discharged from the site to the Bay. Hazardous materials impacts from all of the above construction-related activities would be reduced to less than significant with the implementation of the mitigation measures identified above, the same as for the Project.

Development under Alternative 4, as for the Project, would require the installation of foundation support piles, which could, under certain soil conditions, create a vertical conduit for chemicals occurring in shallow groundwater to migrate to the deeper groundwater aquifer. However, as for the Project, MM HZ-5a, which requires preparation of a plan for pilot boreholes for each pile to prevent disturbance of potentially contaminated fill materials and would reduce this potential impact from pile driving to less than significant, the same as for the Project.

Alternative 4 would not include construction of the Yosemite Slough Bridge, which would avoid impacts associated with disturbance of potentially radiologically impacted soils at HPS Phase II in the vicinity of Parcels E and E-2. Also, because Alternative 4 would preserve historically significant buildings on HPS Phase II proposed for demolition under the Project (Buildings 211, 224, 231, and 253), this Alternative would result in less land disturbance in the area of the site where these buildings are located as compared to the Project, thus reducing the potential for exposure to hazardous materials in soil or groundwater in this area.

- As part of Alternative 4, the retained historic buildings would require abatement of existing hazardous materials such as asbestos, PCBs from electric fixtures, and lead-based paint. Those abatement activities would be a typical step in a reuse and rehabilitation plan. In addition, any contaminated soil or groundwater at the site of those buildings would be remediated or encapsulated under methods subject to the various legal or administrative requirements outlined in Draft EIR Section III.K. Those remediation activities would not preclude rehabilitation or reuse of the buildings in the identified Hunters Point Commercial Dry Dock and Naval Shipyard Historic District if they have been cleared for reuse by the Navy. The Navy has identified Buildings 211 and 253 as radiologically impacted buildings. The Navy would not make a determination as to whether these buildings can be cleared for reuse until at the earliest, fall 2010, but all required radiological remediation would be completed before the Navy transfers the property to the Agency. As noted in Draft EIR Section III.K, pages III.K-27 to -28, "Basewide Historical Radiological Assessment" section:

- > The overall conclusion of the Historical Radiological Assessment (HRA) was that although low levels of radioactive contamination exist at HPS, no imminent threat or substantial risk exists to tenants, the environment of HPS, or the local community.[313] This conclusion has been reinforced by subsequent Finding of Suitability for Lease (FOSL)[314] issued by the Navy for areas in Parcel B and Building 606 in Parcel D and approved by the regulatory agencies authorizing leases for various uses involving hundreds of employees, artists, and visitors in close proximity to various "impacted" sites each day. A Basewide Radiological Work Plan was subsequently prepared, describing survey and decontamination approaches to be implemented in support of radiological release of buildings and areas.[315]

Alternative 4 would place housing in the area of the HPS Phase II site proposed for the stadium and stadium parking. The Navy's cleanup plan is designed to remediate the HPS site to levels acceptable for the planned uses in the existing HPS Redevelopment Plan. To the extent that Alternative 4 proposes to place housing in areas not designated for residential use in the existing HPS Redevelopment Plan, additional hazardous materials remedial work could be required, which could result in some increased risk to workers, the public and environment from exposure to hazardous materials during the construction process. Any property that has not been remediated for unrestricted use at the time of transfer will have use restrictions placed on the property in compliance with the federal clean-up process. For use restrictions to be removed, the Project Applicant would be required by the transfer documents to obtain approval from the regulatory agencies overseeing the clean-up process before residential uses could be placed on these portions of the site. Any remedial activities undertaken as part of the construction process would be subject to the requirements in MM HZ-1b, which requires construction activities at HPS Phase II to be done in accordance with all restrictions imposed on the site by the federal regulatory clean-up process and these impacts would be less than significant, the same as for the Project.

Potential impacts associated with disturbance of naturally occurring asbestos would be similar to those associated with the Project and would be mitigated through MM HZ-15, which requires the preparation of dust control plans as required by BAAQMD and DPH. As for the Project, Alternative 4 would involve the demolition of existing structures that may contain asbestos-containing building materials, lead-based paint, and other hazardous materials. The preservation of historic buildings may likewise result in disturbance of such hazardous materials. The existing regulatory framework and approval process would avoid potential hazards from demolition or building preservation activities and impacts would be less than significant, the same as the Project.

Alternative 4 would involve off-site roadway improvements, which could result in disturbance of hazardous material in soil or groundwater. Unacceptable exposures would be controlled as for the Project by implementation of MM HZ-1a, and hazardous materials impacts from these activities would be less than significant.

Project operations would involve routine use, storage, transport, or disposal of hazardous materials. The use of such materials would be reduced compared to the Project, because of a 30 percent reduction in residential and most non-residential uses. In addition, the marina would not be constructed, resulting in less hazardous materials usage associated with boat cleaning and maintenance supplies. Compliance with applicable federal, state, and local regulations related to the use, storage and transport of such materials would result in a less-than-significant impact from hazardous materials usage, the same as for the Project.

Geology and Soils

Construction activities, such as removal of paved areas, grading, and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. However, requirements to control surface soil erosion during and after construction of Alternative 4 would be implemented through the requirements of the identified mitigation measure (MM HY-1a.1), and adverse effects on the soil such as soil loss from wind erosion and stormwater runoff would be reduced to a less-than-significant level. Soil erosion impacts associated with construction of the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 4. Soil erosion impacts would also be reduced because the development footprint at Candlestick Point and HPS Phase II would be reduced.

Construction activities would have the potential to affect groundwater levels. Construction may include dewatering procedures during excavation, construction, and operation of foundations and buried utilities. Dewatering could cause settlement of adjacent soils that could damage the overlying foundations of existing buildings. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by the identified mitigation measure (MM GE-2), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Similar to the Project, settlement hazards related to dewatering would be less than significant for development under Alternative 4, the same as for the Project.

Development of Alternative 4 would require rock removal activities at the Alice Griffith and Jamestown districts that could result in damage to structures from vibration or settlement caused by the fracturing of bedrock for excavation. With implementation of the identified mitigation measure (MM GE-3), vibration from controlled rock fragmentation in the area would not cause unacceptable settlement at adjacent or nearby properties. Similar to the Project, settlement hazards related to controlled rock fragmentation would be less than significant for development under Alternative 4, the same as for the Project.

The potential for exposure to adverse effects caused by seismic groundshaking and seismically induced ground failure such as liquefaction, lateral spreading, landslides and settlement exists at the Project site. The identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-5a, and MM GE-6a) would require design-level geotechnical investigations for development under Alternative 4. Design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of structures, as required by the SFBC through review by DBI. The structural

design review would ensure that all necessary mitigation methods and techniques are incorporated in the design for foundations and structures to reduce potential impacts from ground failure or liquefaction to a less-than-significant level for development under Alternative 4. Seismic-related groundshaking hazards associated with the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 4, although the Project would mitigate these potential impacts to less than significant.

The existing shoreline exhibits active erosion and consists of areas of unprotected slopes and dilapidated naval pier and wharf structures. Similar to the Project, Alternative 4 would include numerous shoreline improvements, including additional concrete revetments, creation of new beach and tidal habitat, and some grading and importation of fill at certain locations. These improvements would improve the stability of the shoreline. Therefore, Alternative 4 would not result in the exposure of structures and facilities at the Project site to substantial adverse effects caused by shoreline instability. Similar to the Project, the impact would be less than significant.

The potential for adverse effects caused by landslides, settlement, expansive and corrosive soils, exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual elements of development for Alternative 4, as specified in the identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, MM GE-6a, MM GE-10a, MM GE-11a) for the Project. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of those mitigation measures, impacts with regards to landslides, settlement, and expansive and corrosive soils would be less than significant. Potential ground failure impacts associated with construction of the Yosemite Slough bridge would be avoided because no bridge would be constructed under Alternative 4.

Hydrology and Water Quality

Alternative 4 would be required to comply with water quality standards, the same as the Project. Therefore, construction activities associated with Alternative 4 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With implementation of mitigation measures MM HY-1a.1 (preparation of a Storm Water Pollution Prevention Plan—SWPPP—for discharges to the Combined Sewer System), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan), impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 4 would include excavation for building foundations and underground utilities that could require short-term and/or long-term dewatering of the affected areas. As no extensive underground space is proposed for Alternative 4, the installation of underground building elements and utilities would not substantially alter groundwater levels, similar to the Project. As such, Alternative 4 would not substantially deplete groundwater supplies and would result in a less-than-significant impact, similar to the Project. As the total amount of open space under Alternative 4 would be slightly greater compared to the Project, the amount of permeable surface within the Project footprint would also be greater. Therefore, Alternative 4 would not interfere substantially with groundwater recharge

such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within Alternative 4 site and, thus, no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of Alternative 4, the existing drainage patterns within the area would generally be preserved. Construction activities associated with Alternative 4 would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 4, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of an SWPPP) impacts would be less than significant, similar to the Project.

Operation of Alternative 4 would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of Alternative 4. In addition, Alternative 4 would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. As the extent of impervious surfaces for Alternative 4 would be reduced compared to the Project, impacts would be less than the Project.

Development under Alternative 4 would not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of Alternative 4 could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exists at or near the site currently, or result in substantial erosion, siltation, or flooding on or off site, similar to the Project. Implementation of Alternative 4 would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to

discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of Alternative 4 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of Alternative 4 would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, Alternative 4 would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

Alternative 4 would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt). Alternative 4 would also have the potential to affect designated critical habitat of the green sturgeon and Central California Coast steelhead and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. However, because Alternative 4 does not include construction of the Yosemite Slough bridge, the stadium, and the marina, potential impacts to such species would be reduced. However, construction activities related to shoreline improvements at HPS Phase II and other development throughout the Project site could still adversely affect these species. In addition, activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the MBTA. Alternative 4 would include implementation of the ecological design features described in the Project's Draft Parks, Open Space, and Habitat Concept Plan that would result in multiple measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the design components would remove invasive species; restore, preserve, and enhance wetland, aquatic, and grassland habitats; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline of HPS Phase II.

With implementation of the identified mitigation measures(MM BI-5b.1 through MM BI-5b.4, MM BI-6a.1, MM BI-6a.2, MM BI-6b, MM BI-7b, MM BI-9b, MM BI-18b.1, and MM BI-18b.2) and ecological design features, Alternative 4 would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Impacts related to construction of the Yosemite Slough bridge, marina, and stadium would be avoided because those improvements would not be constructed under Alternative 4. Consequently, impacts would be less than the Project, and, similar to the Project, impacts would be less than significant after mitigation.

Similar to the Project, development of Alternative 4 could have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG or USFWS. The only sensitive habitats other than wetlands and aquatic habitats are eelgrass and areas designated as EFH. Impacts to such communities resulting from construction of the Yosemite Slough bridge, shoreline abutments for the proposed marina, and installation of the breakwater at HPS Phase II would be avoided because those improvements would not be constructed under Alternative 4. With implementation of the identified mitigation measures (MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12b.1, MM BI-12b.2, MM BI-12b.3, MM BI-18b.1, MM BI-18b.2, MM BI-19b.1, and MM BI-19b.2), impacts of Alternative 4 on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG, NMFS, or USFWS would be reduced to a less-than-significant level. Potential impacts to eelgrass beds would be the same as the Project (eelgrass beds are not located near Yosemite Slough), while impacts to EFH would be less than the Project since construction associated with the Yosemite Slough bridge would be avoided and, thus, EFH would not be impacted through the construction of pilings required to support the bridge.

The shoreline improvements included Alternative 4 could have substantial temporary and permanent adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. However, such impacts would be substantially reduced compared to the Project because the Yosemite Slough bridge and marina would not be constructed. As a result, impacts to approximately 3 acres of other waters, 0.01-acre tidal salt marsh, and 1 acre of shadow fill would be avoided. The identified mitigation measures (MM BI-4a.1 and MM BI-4a.2) would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the USACE, SFRWQCB, and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of the identified mitigation measures, the impacts of development under Alternative 4 to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project. However, impacts would be less than the Project.

Similar to the Project, development of Alternative 4 could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site. The Project site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Project site. However, similar to the Project, implementation of Alternative 4 would place new residential towers (three fewer than the Project). The increase in strike hazards from the tall buildings to alter flight paths could substantially interfere with migratory avian flight paths, which would be considered a potentially significant impact to migratory birds. The potential for lighted stadium towers to present a strike hazard to migratory birds would be eliminated under Alternative 4. With respect to aquatic species, although migratory fish could continue to move though the open water and Yosemite Slough, the Project site does not contain any substantial migratory fish pathways such as anadromous fish streams. However, construction of

breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact eels such that productivity and survival of these habitats would be substantially reduced. Alternative 4 would not include construction of the Yosemite Slough bridge, stadium, or marina, which would result in fewer potential impacts to these habitats compared to the Project. Similar to the Project, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-20a.1, and MM BI-20a.2), the potential impacts of Alternative 4 would be reduced to a less-than-significant level because it would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Similar to the Project, Alternative 4 would be required to comply with mitigation measure MM BI-14a to ensure that Project development would not result in conflicts with the City's tree protection ordinances. With implementation of MM BI-14a, Alternative 4 would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant, similar to the Project.

Public Services

Police Protection

During construction of Alternative 4, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. The purpose of a CTMP is to ensure that the impacts of construction on the public domain, in particular with respect to temporary interruptions to vehicular and pedestrian traffic, are considered and addressed. Because Alternative 4 would include the same mitigation as the Project, there would be a similar requirement to prepare a CTMP for Alternative 4 that would address temporary impacts on circulation during construction. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. Construction activities associated with implementation of Alternative 4 also could increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. To ensure adequate site security, mitigation measure MM PS-1 would require the Project Applicant to provide security during construction. Therefore, this impact would be less than significant, the same as for the Project.

Implementation of Alternative 4 would increase resident and employee population at the Project site. However, because 30 percent fewer residential units would be constructed under this Alternative, the associated demand for additional police personnel would be reduced compared to the Project. Alternative 4 would result in a potential increase in the need for 37 additional police personnel to provide a comparable level of service to existing conditions compared to the Project's potential increase in need of 53 personnel.[1365] The SFPD evaluates the need for additional officers by sector, and not station or district needs. While it is unlikely that 37 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development of Alternative 4.

[1365] The number of required police officers need to meet comparable level of service to existing conditions was determined using the total daytime population of Alternative 4 (residential population of 17,126 plus 7,578 employees) and the ratio of officers to population presented in Table II.O-2 (1:665 officer to population).

If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 sf could be constructed within the Project site, on land designated for community-serving uses. As part of Alternative 4, up to 100,000 gsf of land divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses including a police station. Construction of a new SFPD facility (counter, storefront, or other configuration) within these community services uses and/or the reconfiguration or expansion of the existing Bayview Station would be funded by the Project Applicant. Similar to the Project, Alternative 4 includes community service use areas, and as construction would be funded by the Project Applicant, the SFPD would maintain acceptable levels of police service. The stadium would not be constructed, which would eliminate the need for additional police services on game days. Therefore, development of this Alternative would not require new or physically altered police facilities beyond the scope of the Project in order to maintain acceptable police services. This impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Fire and Emergency Medical Services

Alternative 4 would add 7,350 residential units and substantially increase employment-generating uses, resulting in an employment population of 7,219. The increase in the residential and daytime employment population (for a total population of 24,345, including a residential population of 17,126 plus 7,219 employees), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services.

During construction of Alternative 4, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. Construction of a new SFFD facility on land designated for community-serving uses on the Project site (where costs would be borne by the Project Applicant), would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. Similar to the Project, construction of 100,000 gsf of community facilities, which would include a new SFFD facility, would be included as a component of Alternative 4. The stadium would not be constructed, which would eliminate the need for additional emergency services on game days. Therefore, development under Alternative 4 would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Schools

A total of approximately 1,492 school-age children would live within the Project site following full build-out of Alternative 4.[1366] While schools in the Project vicinity have approximately 49 percent capacity remaining in the 2008-2009 school year, it is likely that a 12 percent overcapacity of SFUSD as a result of citywide population growth in 2030 would occur. Similar to the Project, the payment of school impact fees pursuant to SB50 would constitute full mitigation for any potential schools impacts. This impact is considered less than significant for development under Alternative 4, the same as for the Project.

Libraries

Construction of Alternative 4 would not result in impacts to the SFPL. No library branches are located on the Project site. All library services would be available to the community throughout the duration of construction. As such, no impact to library services during construction of Alternative 4 would occur.

Residential and nonresidential development associated with Alternative 4 would increase demand for local library services in the Bayview neighborhood, although due to a 30 percent reduction in residential units, this demand for local library services would be less than under the Project. Although this Alternative would result in a substantial direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the Portola, Visitacion Valley, and the Bayview branches would continue to meet the demands of the community. In addition to the three library branches serving Alternative 4, the proposed development would include space dedicated to library services to supplement the Bayview branch library. As part of Alternative 4, a 1,500-gsf reading room and automated book-lending machines would be integrated into the community retail and public facilities uses. The SFPL branches, and the dedication of space to accommodate library services on the Project site in order to supplement SFPL branches, would accommodate increased demand from development under this Alternative. No additional library facilities would be required to accommodate development of Alternative 4. Therefore, no new or physically altered library facilities would be required in order to maintain acceptable service ratios and this impact is considered less than significant for development under Alternative 4.

Recreation

- Implementation of Alternative 4 would include parks and open space areas similar to the Project and the same State Parks land agreement, which would result in improvements to the CPSRA. Construction activities associated with the proposed parks and recreational facilities are considered part of the overall development footprint. Although the amount of construction would be reduced, the construction activities related to this Alternative are similar to the Project, construction impacts anticipated to result from implementation of this Alternative are analyzed throughout the technical sections of this EIR. Such impacts would be temporary and would be mitigated by measures identified in Section III.D, Section III.H, Section III.I, Section III.K, Section III.M, and Section III.N. These measures address construction-related impacts including, but not necessarily limited to, traffic and circulation, air quality, noise, exposure to hazardous material, and soil erosion, which would help reduce potential impacts to recreational resources. Construction impacts associated with development of new parks and recreational facilities would be less than significant.

[1366] For Alternative 4, 7,350 residential units multiplied by 0.203 SFUSD student generation rate would result in 1,492 students.

- At build-out of Alternative 4, the projected population within the Project site would increase from approximately 1,113 residents to approximately 17,126 residents, while employment would increase from 529 jobs to approximately 7,219 jobs. Similar to the Project, parks and open space included in Alternative 4 would provide a ratio of about 20.4 acres of parkland per thousand residents, which is substantially higher than the benchmark ratio of 5.5 acres per thousand residents (refer to Section III.P). A total of 5.9 acres of neighborhood parks would be constructed at Candlestick Point compared to 8.1 acres under the Project. The increase in population and employment could result in an increase in the use of existing parks, recreational facilities, and open space. During a given phase, however, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual, and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed. Parks and open space at HPS Phase II would include improvements similar to the Project and would help offset the increase in demand created by new residents and employees. The 1.4-acre Alice Griffith Neighborhood Park would serve residents of the Alice Griffith Public Housing site. The impact would be less than significant, the same as for the Project.

  The high-frequency BRT route around Yosemite Slough, rather than over the slough on the Yosemite Slough bridge as proposed under the Project, presents more at-grade bicycle and pedestrian conflicts for residents of the Bayview District seeking access to the slough and the Bay Trail. In the Project, the BRT is physically separated from the Bay Trail and connecting bicycle/pedestrian trails, eliminating crossing conflicts between the Bay Trail and the Bayview. This is a potentially significant impact that would not occur under the Project.

  A windsurfing launch site is located in the CPSRA. Windsurfing could potentially be impacted by the construction of tall structures in close proximity to the Bay that affect wind patterns and direction. Similar to the Project, development under Alternative 4 would include structures above 100 feet in height. Alternative 4 would include seven towers at Candlestick Point, compared to eleven towers with the Project, and the average tower height would be similar under Alternative 4. Compared to the Project, three towers would be removed from the Candlestick Point North district, one tower would be removed from the Candlestick Point South district, and the stadium would not be constructed. Therefore, due to the reduced number of towers and building heights, impacts to windsurfing would be less than significant, and less than the Project.

Utilities

Water Supply

Alternative 4 would include water infrastructure similar to the Project. Impacts of construction activities associated with this infrastructure, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of water conveyance or treatment infrastructure associated with the Project. The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with the Alternative 4.

Alternative 4 would include less residential and non-residential development compared to the Project. Alternative 4 would generate a total demand of approximately 1.21 mgd, 0.4 mgd less than the Project. As current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Alternative 4 on water demand would be an increase of approximately 0.91 mgd.[1367] As stated in the Water Supply Assessment provided for the Project, the SFPUC projects that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions (refer to Appendix Q1). Therefore, there would be sufficient water supplies to accommodate the water demand of Alternative 4. This is considered to be a less-than-significant impact. Similar to the Project, implementation of Alternative 4 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant.

Implementation of Alternative 4 would require expansion of the existing off-site AWSS by providing an AWSS loop at Candlestick Point that would connect to the planned extension of the existing off-site AWSS on Gilman Street from Ingalls Street to Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road. Implementation of the identified mitigation measure (MM UT-2) would ensure the provision of adequate water for on-site fire-fighting purposes, and the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact is less than significant with implementation of this mitigation measure.

Wastewater

Alternative 4 would discharge a maximum peak flow of 479 gpm to the Candlestick tunnel sewer, which has an existing unused capacity of 28,035 gpm in dry weather. This flow would combine with a maximum peak flow of 1,153 gpm from the HPS Phase II into the Hunters Point tunnel sewer. The total maximum peak Project flows of 1,632 gpm (826 gpm less than the maximum peak flow of the Project) would combine in the Hunters Point tunnel sewer, which has an existing unused capacity of 69,853 gpm in dry weather.[1368] This represents 1.2 percent of the available capacity of the Hunters Point tunnel sewer, which could be accommodated by the existing off-site infrastructure.

The maximum peak flow of wastewater generated under Alternative 4 would be 826 gpm less than the maximum peak flow of the Project. The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the development of Alternative 3. Overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows, assuming completion of utility infrastructure prior to occupancy of Alternative 4. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of the Alternative 4. It is possible that a temporary increase in CSO volume could occur (which could affect the capacity of the SWPCP for treatment) during wet weather, as noted, above. Implementation of the identified mitigation measure (MM UT-3a) would reduce this impact to less than significant by providing

[1367] Water demand for this alternative was estimated by prorating water demand for the Project (presented in Table III.Q-4) based on build-out of Alternative 4.
[1368] Wastewater generation for this alternative was estimated by using the generation rates presented in Table III.Q-5 based on build-out of Alternative 4.

temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for Alternative 4. Thus, Alternative 4 would not result in any net increase in CSO volume in the Bayside system during wet weather. A less-than-significant impact to existing off-site treatment facilities would occur.

Development associated with Alternative 4 would incrementally contribute wastewater during dry and wet-weather events to the Combined Sewer System operated by the SFPUC, but overall, wet-weather volumes would decrease in the Bayside system with construction of the alternative's separate stormwater and wastewater systems. In addition, the maximum peak flow of wastewater generated under Alternative 4 would be 826 gpm less than the maximum peak flow of the Project. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that Alternative 4 would not exceed the applicable wastewater treatment requirements of the RWQCB. In addition, Alternative 4 would not cause the City to exceed the requirements of the NPDES permit for the reasons previously stated and because the flows during wet weather would actually decline compared to existing flows from the Project site. This impact would be less than significant.

Solid Waste

Demolition of existing facilities within the Project site under Alternative 4 would be similar to the Project. Similar to the Project, some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. With implementation of the identified mitigation measure (MM UT-5a), the Project Applicant would be required to submit a Waste-Diversion Plan demonstrating strategies to divert at least 75 percent of total construction wastes before receiving building permits. This impact would be less than significant.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1369] Under Alternative 4, demolition activities, which generate construction debris, are expected to conclude in 2024 at Candlestick Point and in 2021 at HPS Phase II, a minimum of five years before the landfill is expected to close. Further, the City requires the diversion of at least 65 percent of construction waste, as also required by mitigation measure MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of Alternative 4 on solid waste would be further reduced. Under Alternative 4, the only construction and demolition activity at Candlestick Point would occur at the Alice Griffith Public Housing site, the Yosemite Slough bridge approach. The Candlestick Park stadium would not be demolished and substantially less construction waste would be generated. The impact of the construction waste generated by Alternative 4 on the capacity of the Altamont Landfill would be less than significant.

Construction activities, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. The amount of these materials would be that could be disturbed would be less than the Project because the development program would be reduced requiring less construction compared to the Project. Potential hazardous materials exposure associated

[1369] CIWMB, 2009.

with construction of the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 4. Hazardous waste would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently during the construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes. Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. Contaminated soils may require transportation off site and treatment at authorized TSDs. Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of Alternative 4 would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact.

At full build-out, Alternative 4 would generate approximately 16,208 tons annually when all uses are fully operational and assuming no waste-reduction measures. The amount of solid waste generated under Alternative 4 would be 5,619 tons less than the Project because the development program would be reduced. Solid waste generated under Alternative 4 would represent approximately 2.7 percent (compared to 3.7 percent under the Project) of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons).[1370] All residents and businesses of Alternative 4 would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant would prepare a Site Waste Management Plan as required by the identified mitigation measure (MM UT-7a.1) that would specify the methods by which the Alternative 4 would divert operational solid waste to assist the City in achieving its diversion goals. The impact of operational solid waste generated by Alternative 4 on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Nearly all uses under Alternative 4 would involve the routine use of hazardous materials at varying levels that would require disposal. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this time. The use of hazardous materials would be less than the Project because the development program would be reduced. The minimal amount of hazardous waste that would be generated by Alternative 4 could be accommodated by existing TSD facilities. Similar to the Project, this impact would be less than significant.

Electricity, Natural Gas, and Telecommunications

The proposed utility infrastructure improvements for Alternative 4 would include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications, the same as for the Project. This alternative would not include the new stadium, marina, or the Yosemite Slough bridge. As the development would be smaller than the Project, less electricity, natural gas, and telecommunications serves would be required. Infrastructure expansion would not be as extensive as required for the Project. However, these differences between Alternative 4 and the Project would not substantially affect the infrastructure plan as presented for the Project and, therefore, impacts would be the same as for the Project, and less than significant.

[1370] Solid waste generation for this alternative was estimated using the solid waste generation rates presented in Table III.Q-8.

Energy

Construction activities associated with implementation of Alternative 4 would require energy sources including electricity, diesel, and gasoline. Similar to the Project, the construction activities for Alternative 4 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy and would be subject to requirements to minimize wasteful fuel consumption. Energy use during the construction period would be similar to the Project but reduced because approximately 30 percent fewer residential units and non-residential space would be developed and construction of the Yosemite Slough bridge, stadium, and marina would not occur. Furthermore, given the type of development proposed under this alternative, the energy demand created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related energy use associated with development under Alternative 4 would be considered less than significant.

Implementation of Alternative 4 would result in baseline electricity consumption substantially less than the Project, because the overall development program (residential and most non-residential uses) would be reduced by approximately 30 percent. In addition, Alternative 4 would include the energy savings associated with the Project Applicant's commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, those efficiency measures would result in consumption of at least 5.4 percent less electricity than a project that would not implement such measures. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts of Alternative 4 to less than significant.

Implementation of Alternative 4 would result in baseline natural gas consumption substantially less than the Project, because the overall development program (residential and most non-residential uses) would be reduced by approximately 30 percent. In addition, Alternative 4 would include efficiency measures similar to the Project resulting in the use of approximately 13 percent less natural gas than a development project without such measures. Those efficiency measures would result in consumption of at least 13 percent less natural gas than a development project without such measures. In addition, the Project Applicant would also implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity; the use of solar thermal energy to provide space cooling with the use of absorption systems; and/or water for space heating and domestic water systems. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential natural gas consumption impacts to a less-

than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts Alternative 4 to less than significant.

Alternative 4 would increase trips to and from the Project site, increasing the use of petroleum fuels. Similar to the Project, fuel consumption resulting from travel to and from the Project site would be five times higher than under existing conditions, indicating a large increase in consumption, although it would be less than the Project due to the 30 percent reduction in residential units. However, this consumption would not be wasteful because (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. However, Alternative 4 lacks the direct, grade-separated BRT connection between Candlestick Point and HPS Phase II that the Yosemite Slough bridge would provide in the Project. This would result in an estimated delay of up to 7 minutes in transit travel times, which would result in fewer transit trips and more automobile trips and an increase in consumption of energy. Similarly, reductions in walking and bicycle trips between Candlestick Point and HPS Phase II that would be accommodated on the Project's bridge could result in increased drive trips and energy use.

Nevertheless, these reductions in transit, bicycle, and pedestrian trips and resulting increases in automobile trips would not likely create a significant energy consumption impact when compared to the Project. Therefore, similar to the Project, Alternative 4 would not be wasteful with respect to petroleum fuel consumption, and impacts are considered less than significant.

Greenhouse Gas Emissions

Similar to the Project, construction activities associated with implementation of Alternative 4 would emit GHGs associated with diesel and gasoline consumption. Similar to the Project, the construction activities for Alternative 4 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not be a prolonged source of GHG emissions. GHG emissions during the construction period would be similar to the Project but reduced because approximately 30 percent fewer residential units and non-residential space would be developed and construction of the Yosemite Slough bridge, stadium, and marina would not occur. Therefore, construction-related GHG emissions and climate change impacts associated with development under Alternative 4 would be considered less than significant.

Implementation of Alternative 4 would result in baseline GHG emissions substantially less than the Project, because the overall development program (residential and most non-residential uses) would be reduced by approximately 30 percent. In addition, Alternative 4 would include the GHG emission savings associated with mitigation measures, including MM GC-1 through MM GC-4, which require the implementation of the Project Applicant's conceptual commitments to (1) reduce energy use to 15 percent

below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*.

Similar to the Project, Alternative 4 would increase trips to and from the Project site, increasing the use of petroleum fuels. Similar to the Project, fuel consumption resulting from travel to and from the Project site would be five times higher than under existing conditions, indicating a large increase in consumption, although it would be less than the Project due to the 30 percent reduction in residential units. However, this Alternative would also include the Project Applicant's commitment to reduce transportation related GHG emissions: (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. These programs would be similar to the Project, but would not be as effective because the entire transportation system proposed under the Project may not be developed. The transportation system and TDM programs were designed to work for development of Candlestick Point and HPS Phase II as proposed under the Project. Efficiencies of the system would be reduced compared to the Project. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel.

However, Alternative 4 lacks the direct, grade-separated BRT connection between Candlestick Point and HPS Phase II that the Yosemite Slough bridge would provide in the Project. This would result in an estimated delay of up to 7 minutes in transit travel times, which would result in fewer transit trips and more automobile trips and an increase in consumption of energy. Similarly, reductions in walking and bicycle trips between Candlestick Point and HPS Phase II that would be accommodated on the Project's bridge could result in increased drive trips and energy use.

Nevertheless, these reductions in transit, bicycle, and pedestrian trips and resulting increases in automobile trips would not likely create a significant energy consumption impact when compared to the Project. Similar to the Project, Alternative 4 would not be wasteful with respect to petroleum fuel consumption. Thus, GHG emissions at the Project site under development of Alternative 4 would not inhibit the achievement of the goals of AB 32 or the SFCAP. Similar to the Project, GHG emissions and climate change impacts would be less than significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The

BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2nd. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for Alternative 4 and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO2e per service population per year and would result in a less-than-significant impact on climate change. Alternative 4 would reduce a similar mix of land use proposed with the Project; however, Alternative 4 would decrease the housing density and alter the service population which would impact the amount of GHG emissions per service population. Without a quantitative analysis, the comparison to the BAAQMD threshold cannot be judged, and Alternative 4 may not be below the proposed threshold.

Attainment of Project Objectives

Alternative 4 would fail to meet several of the Project objectives because it would include a reduced development program, including a 30 percent reduction in residential and most non-residential uses, no State Lands agreement, no development of the Yosemite Slough bridge or stadium, and no development of the marina compared to the Project. Refer to Table VI-8 (Attainment of Project Objectives Alternative 4) below for a discussion of each objective.

Table VI-8 Attainment of Project Objectives Alternative 4

Objective	*Meets Project Objective?*	*Analysis*
1. The integrated development should produce tangible community benefits for the Bayview and the City.	Y-	Alternative 4 would include opportunities for job and economic development. However, compared to the Project, such opportunities would be reduced because most of the employment-generating uses would be reduced by 30 percent. There would be no grade-separated, direct transit connection between Candlestick Point and HPS Phase II. In addition, it would include substantially less parks and open space amenities compared to the Project. Alternative 4 would not meet this objective to the same extent as the Project.
2. The integrated development should re-connect Candlestick Point and the Hunters Point Shipyard site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents.	Y-	The proposed mix of uses and urban design concepts would provide a direct physical, visual, and architectural connection to the Bayview neighborhood and City. This alternative also includes extension of the transportation network into the Project site, particularly for transit. Those connections would allow residents of the Bayview neighborhood and City to access the commercial, cultural, and institutional opportunities at the Project site. The Alternative 4 development program would be reduced compared to the Project. Therefore, Alternative 4 would not meet this objective to the same extent as the Project.
3. The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourage the rebuilding of Alice Griffith Housing.	Y-	Alternative 4 would include a variety of unit types, sizes, and structures, and a wide range of affordability levels. This alternative would include the redevelopment of the Alice Griffith Public Housing site. However, overall there would be a reduced amount of affordable housing units developed under Alternative 4, because the residential development would be reduced by 30 percent. Therefore, Alternative 4 would not meet this objective to the same extent as the Project.
4. The integrated development should incorporate environmental sustainability concepts and practices.	Y	Although the overall development program would be reduced, Alternative 4 would include similar sustainability principles compared to the Project. Therefore, Alternative 4 would meet this Project objective.
5. The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure.	N	Alternative 4 would not construct a new stadium for the 49ers. Therefore, Alternative 4 would not meet this Project objective.
6. The integrated development should be fiscally prudent, with or without a new stadium.	Y-	Development of Alternative 4 would increase sales tax revenue to the City. However, the amount of sales tax generating use would be less than the Project and would meet this objective to a lesser extent than the Project. Alternative 4 would include a development program that would encourage substantial private capital investment. The overall development program would be reduced and Alternative 4 would meet this objective to a lesser extent than the Project.

Y = Alternative does meet Project objective.
Y- = Alternative meets Project objective, but to a lesser extent than the Project.
Y– = Alternative meets Project objective, but to a significantly lesser extent than the Project.
N = Alternative does not meet Project objective.

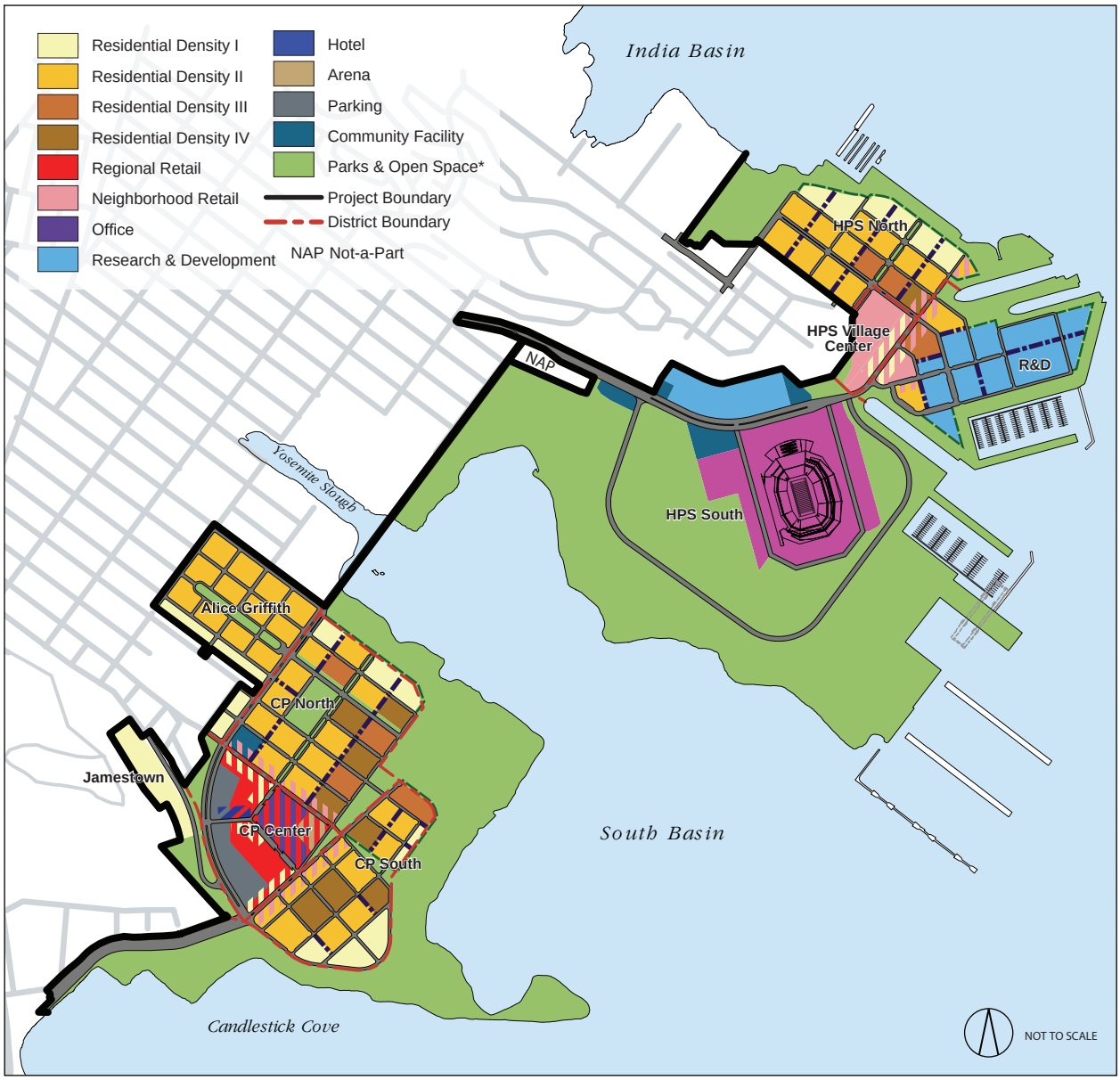
VI.C.4a Subalternative 4A: CP-HPS Phase II Development Plan with Historic Preservation

Alternative 4 (Reduced CP-HPS Phase II Development; Historic Preservation; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge) analyzes a reduced-development alternative while preserving the five historic structures (Buildings 208, 211, 224, 231, and 253) that are part of the California Register of Historical Resources (CRHR)-eligible Hunters Point Commercial Drydock and Naval Shipyard Historic District. Subalternative 4A includes the Project's full land use program and the historic preservation component of Alternative 4. Refer to Figure VI-3a (Subalternative 4A Land Use Plan) for an illustration of the proposed Subalternative 4A land use plan.

This subalternative, like the Project, would retain Drydocks 2 and 3 and four buildings (Buildings 140, 204, 205, and 207) previously identified as historic resources in National Register of Historic Places (NRHP)-eligible Hunters Point Commercial Drydock Historic District, This subalternative and the Project would also retain Drydock 4, considered individually eligible for the NRHP, and Building 208, part of the CRHR-eligible historic district. Like Alternative 4, Subalternative 4A would retain Buildings 208, 211, 224, 231, and 253. Building 208 would be mothballed, the same as under the Project. Buildings 211, 231, and 253 would be rehabilitated under the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Secretary's Standards) to accommodate approximately 338,000 gsf of R&D and 1,000 parking spaces. The rehabilitation would occur generally as recommended by Page & Turnbull's *Hunters Point Shipyard Feasibility Study* (July 1, 2009, included in the EIR as part of Appendix J). Total floor area for R&D would remain the same as the Project, i.e., 2,500,000 gsf. Building 231 would be reused for parking. Buildings 211 and 253 would accommodate R&D uses. The feasibility study proposed parking uses for Building 231, to accommodate parking as part of the overall HPS Phase II land use program, and as a use appropriate for the large volume of Building 231. Building 224, the air raid shelter, would be retained as museum space. All mitigation measures for the Project would also be applied to Subalternative 4A except for MM CP-1b.1, which requires documentation of demolished buildings.

Because Subalternative 4A proposes the Project's land use program, except for Impact CR-1b, the impacts identified for the Project would also occur with Subalternative 4A. Preservation of these buildings would change some of the analysis in Aesthetics, Hydrology and Water Quality, and Greenhouse Gas Emissions, but not the impact conclusions in these sections. The impacts and analysis identified for the Project in the following issue areas would be the same for Subalternative 4A as identified for the Project:

- Land Use and Plans
- Population, Housing, and Employment
- Transportation and Circulation
- Air Quality
- Noise
- Paleontological Resources
- Hazards and Hazardous Materials
- Geology and Soils
- Hydrology and Water Quality (except sea level rise)
- Public Services



SOURCE: Lennar Urban, 2010.

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FIGURE VI-3a

Candlestick Point — Hunters Point Shipyard Phase II EIR

SUBALTERNATIVE 4A LAND USE PLAN

- Recreation
- Utilities
- Energy

The impacts and analysis identified for Alternative 4 in the following issue area would be the same for Subalternative 4A as identified for the Project, as Subalternative proposes the historic preservation component of Alternative 4:

- Cultural Resources

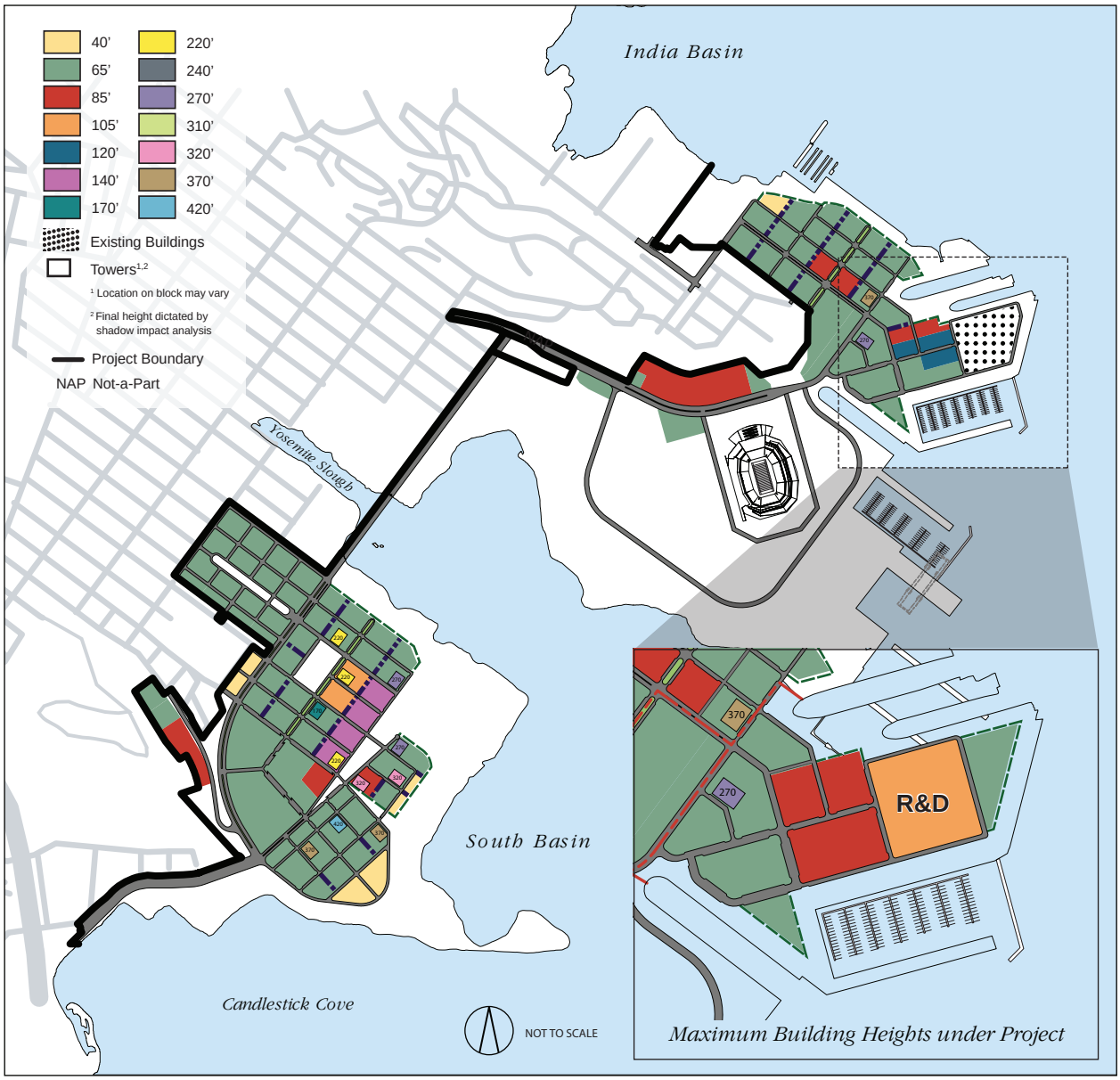
To document that there would be no change with respect to Transportation and Circulation, Air Quality, or Greenhouse Gas Emissions, refer to Appendix T4 (ENVIRON, Updated Air Quality Analysis Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Updated Variants 2A and 3 [Tower Variant D], Alternative 2, and Subalternative 4A, April 26, 2010), Appendix T5 (ENVIRON, Updated Greenhouse Gas Emissions Calculation for Candlestick Point–Hunters Point Shipyard Phase II Development Plan—Variants 2A and 3 [Tower Variant D], Alternative 2, and Subalternative 4A, March 12, 2010), and Appendix T7 (LCW Consulting, CP-HPS Phase II Development Plan Transportation Study—Subalternative 4A, March 15, 2010).

Revised analyses for Aesthetics, Hydrology, and Greenhouse Gases are discussed, below.

Aesthetics

To provide for the same land use program as the Project, the height of some buildings in the R&D District of HPS Phase II would be greater than that analyzed under the Project to accommodate the displaced R&D resulting from preserving Buildings 211, 224, 231, and 253. The structures in the R&D District immediately west of the buildings to be preserved would increase from 85 feet maximum with the Project to 120 feet maximum with Subalternative 4A. Refer to Figure VI-3b (Subalternative 4A Maximum Building Heights) above, showing areas that would have maximum heights of 65 feet, 85 feet, or 120 feet, compared to 65 feet to 105 feet with the Project. For reference, existing Building 211 is about 45 feet in height, Building 231 is about 80 feet, and Building 253 ranges from 70 feet to 122 feet (and to 158 feet at the top of its tower element).

Figure VI-3c (Subalternative 4A View 18a: Southeast from Hilltop Open Space) is a visual simulation of building height and massing of Subalternative 4A from a viewpoint on Hillpoint Park. As noted in this figure, the proposed building heights with Subalternative 4A would still preserve expansive Bay views. From long distances, the change would be relatively unnoticeable, and, thus, would not adversely affect scenic vistas. From mid-range views as identified for the Project, the changes in height would be noticeable, but the residential towers at HPS would remain a predominant feature in the views from and to the north. The scale of development would be similar to other areas of San Francisco, such as parts of downtown or Rincon Hill. Development of Subalternative 4A would provide a continuation of the existing street grid, thereby maintaining existing view corridors to the Bay and East Bay hills. Public access areas, both City and State parks, would maintain views from the Project site toward the East Bay and the Bay. Subalternative 4A would not result in additional tower clustering or other structures that would substantially obstruct, alter, or degrade the quality of views of the Bay or beyond from any long-range viewpoints. Views of Bayview Hill and Hunters



SOURCE: Lennar Urban, 2010.

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FIGURE VI-3b

Candlestick Point — Hunters Point Shipyard Phase II EIR

SUBALTERNATIVE 4A MAXIMUM BUILDING HEIGHTS



Existing



Proposed

SOURCE: Lennar Urban, 2010.

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FIGURE VI-3c

Candlestick Point — Hunters Point Shipyard Phase II EIR

SUBALTERNATIVE 4A
VIEW 18a: SOUTHEAST FROM HILLTOP OPEN SPACE

Point Hill from the East Bay would be partially obstructed from Alameda and the Oakland area by Subalternative 4A structures; however, the amount of the obstruction would be minimal and not considered to be significant because of the distance across the Bay. Subalternative 4A development would not obstruct, alter, or degrade the quality of any existing views of the site from these locations. The impact on scenic vistas would remain less than significant, the same as for the Project.

With regard to impacts on scenic resources such as the Yosemite Slough, the Re-gunning crane, Double Rock, Bayview Hill, and Hunters Point Hill, the somewhat taller building heights in the R&D District are far from all of these features except the gantry crane and Hunters Point Hill. Hunters Point Hill is a prominent scenic resource west of the HPS Phase II site and would remain intact with development of Subalternative 4A. Views of Bayview Hill would not be significantly obstructed by Subalternative 4A development in HPS Phase II except from close-in vantage points. Subalternative 4A would retain structures in the CRHR-eligible Hunters Point Commercial Drydock and Naval Shipyard Historic District, as well as the Re-gunning crane, a highly visible feature. The Re-gunning crane is so large and visible that an increase in some building heights of 35 feet at the center of the R&D District would have no discernable impact on this visual resource. Development of the HPS Phase II site would also include about 240 acres of new and renovated parkland with improved public access, thereby improving the scenic quality of the area. The proposed shoreline improvements and construction of the new marina would improve the aesthetic quality of the shoreline along HPS Phase II, reducing erosion, including marsh plantings where appropriate, and removing debris. These improvements would represent a beneficial impact of the development, improving the overall visual character of the shoreline.

The CRHR-eligible historic district as part of Subalternative 4A would be bounded by new R&D development to the west and by the shoreline areas of HPS and San Francisco Bay to the north and south. Structures in the historic district, including Buildings 208, 211, 224, 231, and 253, are large-scale industrial buildings ranging from 45 feet to 122 feet, with part of Building 253 rising to 158 feet. While R&D development up to 120 feet in height would be a different design than most of the existing structures in the historic district, that new development would not alter the visual setting of the historic district such that its integrity would be impaired. In addition, the historic district would retain its waterfront setting, including the drydocks. Therefore, development at the HPS Phase II site under Subalternative 4A, as for the Project, would not have significant adverse impacts on scenic resources or other features that contribute to a scenic public setting, and the impact would be less than significant. No mitigation is required.

The height modifications in the R&D District under Subalternative 4A would not increase any impacts to visual character. The towers to be developed on HPS Phase II would remain the predominant visual element in terms of buildings, and the additional heights of some of the R&D buildings would not affect the planned urban character of the site. Subalternative 4A would replace deteriorating structures, vacant parcels, expanses of asphalt and dirt, and piles of rubble and debris with a high-quality environment that would include a variety of architectural styles and open space. Therefore, Subalternative 4A, in replacing existing uses and structures, and in light of the analysis of changes in visual conditions presented throughout Section III.E (Aesthetics) of the EIR, would not substantially degrade the visual quality or character of the HPS Phase II site or its surroundings and the impact would be less than significant. No mitigation is required.

The wave protection berm for the historic district and the grade change from the remainder of HPS development would result in a "step-down" effect from the western portions of the R&D District to this area. The resulting visual change would be less than significant.

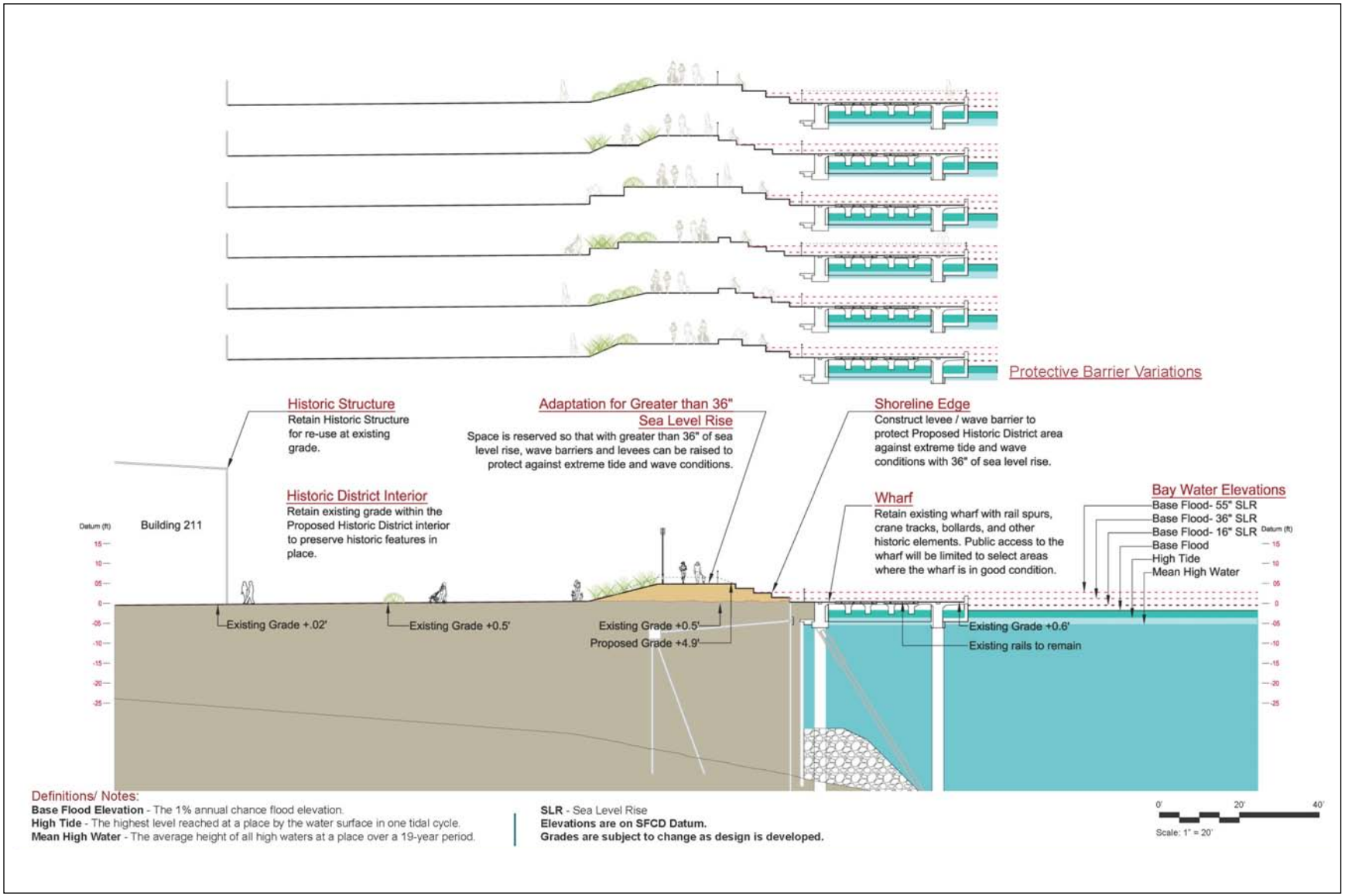
The wave protection berm would alter the view of visitors and employees in the area of the rehabilitated buildings toward the Bay, but since the berm is only 3 feet high, it would not block views. The Bay Trail would be located on top of this berm in some areas, and outside the berm in others. Refer to Figure VI-3d (Subalternative 4A: Conceptual Berm Design for Historic Preservation Area) for a conceptual drawing of the proposed berm. The impacts would be less than significant, the same as for the Project.

Hydrology and Water Quality (Sea Level Rise)

To address sea level rise, Alternative 4 would raise the grade at the site of Buildings 208, 211, 224, 231, and 253 to match the grade on the remainder of the development at HPS Phase II, i.e., 3.5 feet above the Base Flood Elevation, as required by mitigation measure MM HY-12a.1. Subalternative 4A, instead, would maintain the existing grade at the site of Buildings 208, 211, 224, 231, and 253, allowing railroad spurs and other historic elements such as bollards, to remain. To protect the historic district from potential sea level rise, a wave protection berm would be constructed around the eligible historic district to accommodate a 36-inch sea level rise, on top of which the Bay Trail would be constructed. The remainder of the site would be graded in accordance with MM HY-12a.1. The impact would be less than significant, the same as for the Project.

Greenhouse Gas Emissions

Implementation of Subalternative 4A would result in baseline GHG emissions similar to the Project and would include the GHG emission reductions associated with mitigation measures, including MM GC-1 through MM GC-4, which require the implementation of the Project Applicant's conceptual commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This subalternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. The existing building space may not be as energy efficient as newly built structures. Therefore, there may be a slight increase in GHG emissions compared to the Project due to this small amount of R&D building space that is contained in the historic buildings. Otherwise, there would be no difference in the greenhouse gas emissions impacts of Subalternative 4A compared to the Project.



SOURCE: RHAA, 2010.

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FIGURE VI-3d

Candlestick Point — Hunters Point Shipyard Phase II EIR

SUBALTERNATIVE 4A: CONCEPTUAL BERM DESIGN FOR HISTORIC PRESERVATION AREA

VI.C.5 Alternative 5: Reduced CP-HPS Phase II Development; No HPS Phase II Stadium, State Parks Agreement, or Yosemite Slough Bridge

Summarized Description

Alternative 5 would have the same overall land use program as the Project. The total number of housing units would be the same as for the Project. However, approximately 1,350 units would be shifted from Candlestick Point to HPS Phase II, because no State Parks agreement would occur, resulting in a smaller development footprint at Candlestick Point. No Yosemite Slough bridge would be constructed and there would be no stadium at HPS Phase II.

Table VI-9 (Comparison of Alternative 5 and Project Build-Out) provides a comparison of the uses proposed in the Project area under the Project and Alternative 5. Figure VI-4 (Alternative 5 Land Use Plan) illustrates the land use plan for Alternative 5.

Detailed Description

Candlestick Point

Alternative 5 would retain the existing configuration of the State Park boundary, and would not include improvements or ongoing funding for operations and maintenance as provided by the Project. As a result, the land area available for development at Candlestick Point would be smaller and 1,350 housing units would be shifted to HPS Phase II. A total of 6,500 residential units would be constructed at Candlestick Point with higher densities, resulting in more mid-rise structures and towers than under the Project. The amount of retail, office, community service, hotel, arena uses would remain as proposed under the Project.

HPS Phase II

Research and development uses, neighborhood retail, community-serving uses, the artists' studios, and marina proposed by the Project are also proposed under Alternative 5. Residential development would increase by 1,350 units, for a total of 4,000 units. The San Francisco 49ers football stadium would not be constructed at HPS Phase II.

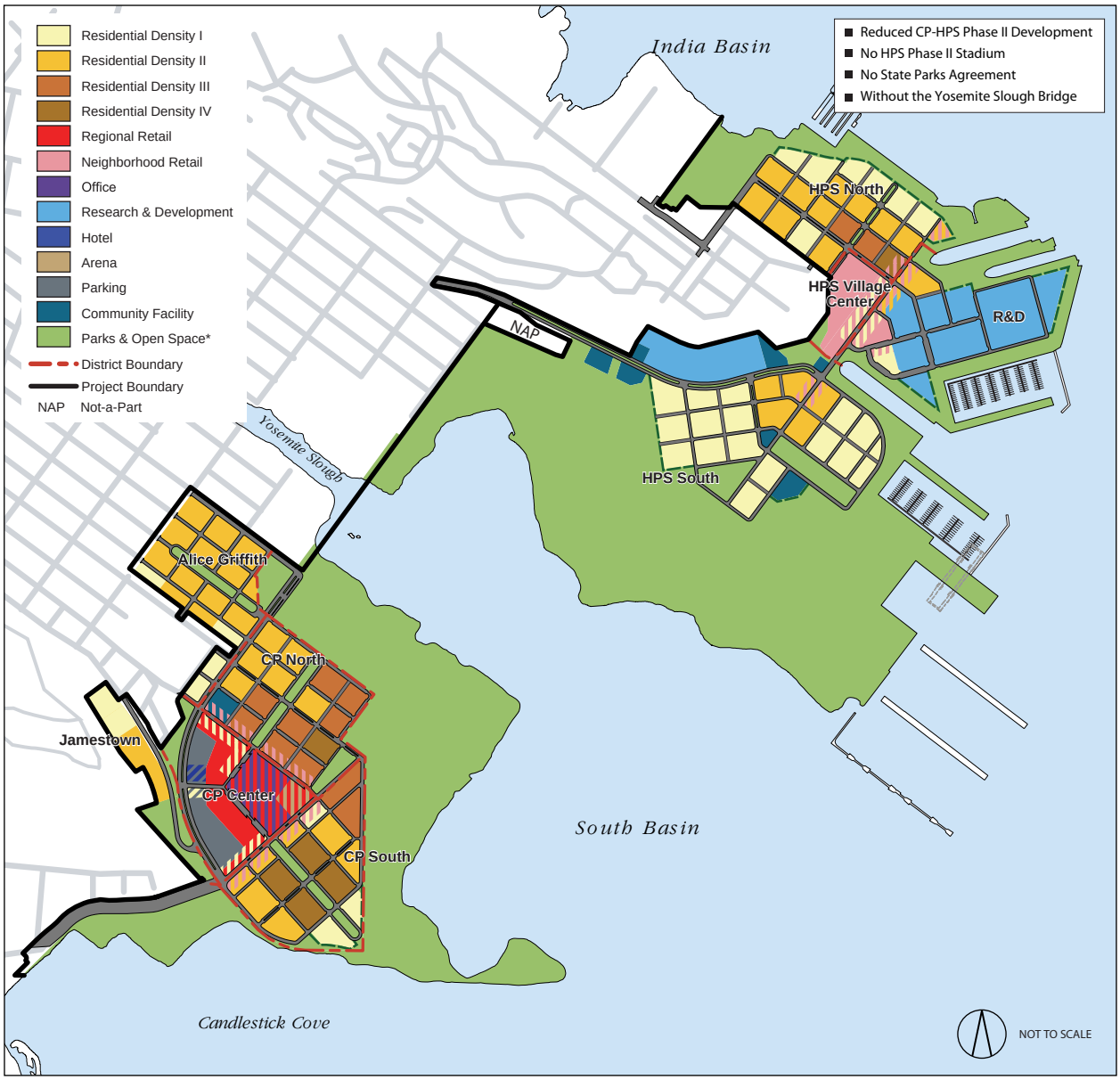
Transportation and Circulation (without Yosemite Slough Bridge)

Under Alternative 5, motorized and non-motorized traffic, including BRT, would be required to circumnavigate Yosemite Slough. The circulation network around Yosemite Slough would be the same as Alternatives 2 and 4, as illustrated in Figure VI-1. The primary roadway connection for automobiles and other vehicular traffic between Candlestick Point and HPS Phase II would be west on Carroll Avenue to Ingalls Street, north along Ingalls Street to Thomas Avenue, and east on Thomas Avenue to Griffith Street. Ingalls Street would remain an industrial mixed-use street with two auto lanes and parking and loading zones on its northern and southern sides. The width of sidewalks on that portion of Ingalls Street from Carroll Avenue to Yosemite Avenue would be decreased from 16 feet to 11 feet to create a uniform street width to accommodate the auto lanes, parking, and loading.

Table VI-9 Comparison of Alternative 5 and Project Build-Out

Use	*Alternative 5*	*Project*	*Comparison to Project*
Candlestick Point			
Residential (units)	6,500	7,850	-1,350
Retail (gsf):			
Regional Retail	635,000	635,000	0
Neighborhood Retail	125,000	125,000	0
Community Services	50,000	50,000	0
Hotel (gsf)	150,000	150,000	0
Office (gsf)	150,000	150,000	0
10,000-seat Arena (gsf)	75,000	75,000	0
Football stadium (seats)	70,000 (existing)	0	70,000
HPS Phase II			
Residential (units)	4,000	2,650	1,350
Neighborhood Retail (gross square feet - gsf)	125,000	125,000	0
Research & Development (gsf)	2,500,000	2,500,000	0
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Community Services	50,000	50,000	0
Football Stadium (seats)	0	69,000	-69,000
Marina (slips)	300	300	0
Totals			
Residential (units)	10,500	10,500	0
Retail (gsf)	885,000	885,000	0
Community Services	100,000	100,000	0
Research & Development (gsf)	2,500,000	2,500,000	0
Artists' Studios (gsf):			
1:1 Studio Renovation & Replacement	225,000	225,000	0
New Artist Center (net gsf)	30,000	30,000	0
Other Elements			
Yosemite Slough bridge	No	Yes	—
Shoreline Improvements	Yes	Yes	—
State Park Agreement/total acres of State Parkland	No/120.2	Yes/96.7	+23.5

SOURCE: Lennar Urban, PBS&J, 2009.



SOURCE: Lennar Urban, 2009.

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FIGURE VI-4

Candlestick Point — Hunters Point Shipyard Phase II EIR

ALTERNATIVE 5 LAND USE PLAN

Between the intersection of Carroll Avenue/Arelious Walker Drive and Crisp Road within HPS Phase II, the proposed BRT line would be routed on Carroll Avenue between Arelious Walker Drive and Hawes Street; on Hawes Street between Carroll Avenue and Armstrong Avenue (currently unimproved); and on Armstrong Avenue between Hawes Street and the Navy rail right-of-way; along the Navy rail right-of-way between Armstrong Avenue and Shafter Avenue; along Shafter Avenue between the Navy rail right-of-way and Arelious Walker Drive; and on Arelious Walker Drive between Shafter Avenue and Crisp Road (currently unimproved).

On Carroll Avenue, Hawes Street, and Armstrong Avenue to the Navy rail right-of-way the BRT line would operate within an exclusive BRT lane, one of the two travel lanes in each direction would be transit-only. Hawes Avenue between Carroll Avenue and Armstrong Avenue, and Arelious Walker Drive between Shafter Avenue and Crisp Road are currently unimproved streets and would be built out to accommodate one transit-only travel lane in each direction. The Navy rail right-of-way between Armstrong Avenue and Shafter Avenue would be improved to provide one transit-only travel lane in each direction. Shafter Avenue between the rail right-of-way and Arelious Walker Drive would be reconfigured to provide four travel lanes, with BRT operating in the center lanes.

Basis for Impact Analysis

For the Project, the potential impacts are generally based on the parameters of the Project, which include the size, bulk, and type of development, the footprint of development, and the number of residents, employees, and visitors to the Project site. For Alternative 5, the impacts of the Project are compared to the impacts of a similar development program, except for the following:

- No State Parks land agreement
- The Yosemite Slough bridge would not be constructed
- The San Francisco 49ers stadium at HPS Phase II would not be constructed. Instead, the same number of residential and retail units as the Project, as well as the same square footages of these uses as the Project, would be constructed on this site, plus 1,350 residential units would be shifted from Candlestick Point to HPS Phase II

Without a State Parks land agreement, there would be no established funding mechanism for future maintenance of the parks on site. Additionally, 23.5 acres of State Parks land would not be available for development at Candlestick Point compared to the Project. Therefore, as a result of not executing the State Parks land agreement, and keeping the overall development program under Alternative 5 the same as that of the Project, the density of development would increase within the overall Project site due to a decrease in available land for development.

With the shift of residential units, the footprint of development at HPS Phase II would be larger in comparison to the Project, and accordingly, the footprint of development at Candlestick Point would be reduced in comparison to the Project. The build-out of all residential and non-residential uses under Alternative 5 would be the same as the Project.

Potential Impacts

Land Use and Plans

Implementation of Alternative 5 would not be expected to divide an established community because it would include infill development, centered on nodes of commercial and retail activity at Candlestick Point and HPS Phase II with no physical division of an established community, the same as for the Project. As with the Project, residential and non-residential infill around these nodes of activity would provide a continuous land use pattern and street grid, provide new services and community amenities in the Bayview Hunters Point neighborhood, allow better access to parks and recreational facilities (which would be improved under Alternative 5), and remove existing barriers to circulation and access over existing conditions. The upland transportation routes for automobile and BRT routes would follow existing streets and railroad right-of-way in the South Basin industrial area surrounding Yosemite Slough. The South Basin industrial area contains a variety of small-scale industrial uses, such as auto repair shops, food distributors, bulk warehouses, and recycling facilities. The area also includes many vacant and underutilized lots. The upland transportation routes would generally run along the southeastern edge of the South Basin industrial area, and not through an established community. Therefore, development under Alternative 5 would not divide an established community and no impact would occur.

Implementation of Alternative 5 would require amendments similar to the Project for the following planning documents: *City of San Francisco General Plan*, *Bayview Hunters Point Redevelopment Plan*, *Hunters Point Shipyard Redevelopment Plan*, Bay Plan, and *San Francisco Bay Area Seaport Plan*. An amendment to the *CPSRA General Plan* would not be required because there would no State Parks land agreement. However, with implementation of the requirements and mitigation measures identified for the Project in Section III.C through Section III.S of this EIR, development under Alternative 5 would not conflict with any applicable land use plans, policies, or regulations (of an agency with jurisdiction) adopted for the purpose of avoiding or mitigating an environmental effect. Furthermore, development under this Alternative would not conflict with any of the policies, goals, and strategies analyzed for the Project. Although the Project is consistent with the Bay Plan polices with regards to Bay fill, it should be noted that development under Alternative 5 would reduce the amount of Bay fill compared to the Project, because the Yosemite Slough bridge would not be constructed. There is no Bay fill associated with construction of the stadium; therefore, the lack of a stadium under Alternative 5 would not lessen impacts to Bay fill in comparison to the Project. Similar to the Project, this impact would be less than significant.

Implementation of Alternative 5 would not result in a substantial adverse change in the existing land use character. Development under Alternative 5 would substantially change the character of the site from open space and industrial uses to an urbanized area representative of other areas in San Francisco. This change would improve deteriorated conditions and connectivity, as well as provide numerous areas of open space, extensive landscaped areas, pleasing architecture, and shoreline improvements, all of which would improve the character of the site. Furthermore, without construction of the Yosemite Slough bridge and San Francisco 49ers stadium, changes to the existing land use character would be less than those created by the Project. Therefore, changes resulting from development under Alternative 5 would not be considered adverse changes. Furthermore, the transition in scale between adjacent neighborhoods and development under this Alternative, as well as the varied range of proposed uses, would not result in a substantial adverse change in the existing land use character of the Project area. Similar to the Project, this impact would be less than significant.

Without a State Parks land agreement, there would be no changes to State Parks land use within the Project site; State Parks land would not be used for development. Therefore, there would be no impacts to the land use character of State Parks, which would less than the Project.

Population, Housing, and Employment

Construction activities associated with implementation of Alternative 5 would induce direct job growth at the site. The number of construction workers that would be employed during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge and San Francisco 49ers stadium would not occur. It is anticipated that construction employees would commute from elsewhere in the region, rather than relocate to the Bayview Hunters Point neighborhood for a temporary construction assignment. Thus, construction under this Alternative would not generate a substantial, unplanned population increase. Direct and indirect impacts associated with construction employment would be less than significant.

Implementation of Alternative 5 would induce direct and indirect population growth, but this growth would not be considered substantial. Similar to the Project, development under this Alternative would result in a total of 10,500 residential units. Total employment generated under Alternative 5 would be slightly reduced compared to the Project site because the San Francisco 49ers stadium would not be constructed. All other employment-generating uses would be the same as the Project. Employment growth generated by development under this Alternative would result in a similar demand for housing units, which would be less than the total number of new housing units (10,500) that would be provided. The jobs and housing units that would be provided at the site would be closely balanced (approximately 10,730 jobs and 10,500 housing units) so that neither a surplus of housing nor jobs would occur, resulting in indirect residential or employment growth. As a result, similar to the Project, the population and employment increase associated with development under Alternative 5 would not be substantial. This impact is considered less than significant.

This Alternative would demolish and replace 256 units at the Alice Griffith Public Housing site. There are currently no other housing units or residents at the Candlestick Point or HPS Phase II sites. Redevelopment of the Alice Griffith site would occur in phases and would, therefore, not displace substantial numbers of existing residents. The phasing of development under Alternative 5 would be different than the Project because there would be no State Parks land agreement. Under the Project, the phasing of the Alice Griffith district would occur on State Park lands. Under Alternative 5, the initial phases would develop current vacant portions of the Alice Griffith site on Candlestick Point North districts, and existing residents would then occupy public housing replacement units before existing structures are demolished in subsequent phases. Therefore, impacts associated with displacement of housing units and residents with development under Alternative 5 are considered less than significant.

Transportation and Circulation

Alternative 5 would not develop a football stadium; there would be no Yosemite Slough bridge. The remaining Alternative 5 land use program would be the same as with the Project.

The Transportation Study analyzed Alternative 5 and conclusions from the Transportation Study are presented below.

Construction Impacts

Construction activities associated with Alternative 5 would be similar to effects with the Project. Localized construction-related traffic impacts would remain significant and unavoidable.

Intersection Conditions

Alternative 5 would have similar project and cumulative effects at the study intersections. Section III.D discusses traffic effects at those intersections, and the feasibility of mitigation measures. In general, intersection conditions would be significant and unavoidable effects of Alternative 5. Game day traffic conditions with a football stadium would not occur.

Freeway Conditions

Alternative 5 freeway mainline sections effects, freeway ramp junctions conditions, and ramp queuing effects would generally be similar to the Project conditions. Freeway impacts with Alternative 5 would be significant and unavoidable.

Transit Impacts

Alternative 5 transit conditions assume implementation of Project-related transit improvements. Alternative 5 would have a less than significant impact on local and regional transit capacity. However, as with the Project, transit impacts would occur from traffic congestion delay. Overall, those transit delay conditions with Alternative 5 would affect the same lines as with the Project as presented in Section III.D, Impact TR-21 to Impact TR-30. As concluded in Section III.D, the transit delay effects would remain significant and unavoidable. During the AM and PM peak hour, Alternative 5 would require up to 28 additional vehicles, the same as with the Project.

Bicycle Impacts

The Alternative 5 bicycle trips would be accommodated within the proposed street and network, although there would not be a Yosemite Slough bicycle and pedestrian route; impacts on bicycle circulation would be less than significant.

Pedestrian Impacts

The Alternative 5 pedestrian trips would be accommodated within the proposed sidewalk and pedestrian network, although there would not be a Yosemite Slough bicycle and pedestrian route; impacts on pedestrian circulation would be less than significant.

Parking Impacts

Alternative 5 would result in a demand for about 21,310 spaces, compared with a maximum permitted supply of about 16,624 spaces; therefore, the maximum off-street parking supply would be about 4,685 spaces fewer than the estimated peak demand. The Project would have a demand for 21,233 spaces and maximum supply of 16,874 spaces, about 4,360 spaces fewer than estimated peak demand. As noted for the Project, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the vicinity, which could, in turn, increase demand for parking in nearby Bayview residential

areas. The loss of parking may cause potential secondary effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Alternative 5 impacts on parking would be less than significant.

This alternative would have less than significant effects on other transportation conditions (loading, air traffic, emergency access).

Aesthetics

Construction activities associated with implementation of Alternative 5 would occur during the same 19-year build-out period and involve the same activities as the Project. Like the Project, those activities would be visible to surrounding land uses and could impact views of scenic vistas and scenic resources in the area. However, any impacts to views would be temporary visual distractions typically associated with construction activities and commonly encountered in developed areas. Because there would be less overall construction with this alternative compared to the Project, impacts to scenic vistas during construction of Alternative 5 would be less than impacts to views of scenic vistas during construction of the Project, although these were identified as less than significant. Construction activities associated with Alternative 5 would have a less-than-significant impact on scenic vistas.

The Yosemite Slough bridge and San Francisco 49ers stadium would not be constructed as part of Alternative 5, and temporary impacts to the slough as a scenic resource would be avoided. There are no adverse impacts, temporary or permanent, on any other identified scenic resource on the Project site as a result of construction activities. The impact would be less than significant, similar to the Project.

As with the Project, construction activities for Alternative 5 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and possibly steel plates that would be visible during construction of the utility infrastructure improvements. Although these activities would take place primarily on site, views of the activities could be available from surrounding land uses. As with the Project, implementation of the identified mitigation measure (MM AE-2) would require the Project developer of Alternative 5 to screen construction sites from public view at street level, provide for appropriate staging of construction equipment, and maintain the cleanliness of construction equipment. Furthermore, without the construction of the Yosemite Slough bridge and San Francisco 49ers stadium, the number and duration of construction sites under development of Alternative 5 would be less than the Project. Therefore, construction activities under Alternative 5 would have a less-than-significant impact on the visual character or quality of the site, the same as for the Project.

Construction of Alternative 5 would occur during daylight hours, and, therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass); however, similar to the Project, the glare created by construction activities at the Project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after hours on all construction sites, but this lighting would be minimal, restricted to the Project site, and would not exceed the level of existing night lighting levels in other urban areas of San Francisco. Furthermore, without the construction of the Yosemite Slough bridge and San

Francisco 49ers stadium, construction activity under development of Alternative 5 would be less than the Project, therefore, creating less potential for glare impacts. In addition, similar to the Project, construction lighting would comply with all City of San Francisco lighting requirements. Therefore, construction activities for development under Alternative 5 would have less-than-significant light and glare impacts, the same as for the Project.

Alternative 5 would include an overall development program similar to the Project, with the exception of the Yosemite Slough bridge, and San Francisco 49ers stadium at the HPS Phase II site, both of which would not be constructed. The State Parks agreement would not be executed, resulting in an increased density of development at Candlestick Point compared to the Project because the development area would smaller. Alternative 5 would include seven towers at Candlestick Point, compared to 11 towers included under the Project, but the average tower height would be greater under Alternative 5 (341 feet compared to 288 feet under the Project). Compared to the Project, there would be three less towers constructed in the Candlestick Point North district and one less towers constructed in the Candlestick Point South district. Development of Alternative 5 would change views from public viewpoints, but would not substantially obstruct any scenic vistas. Overall, development of Candlestick Point would not block publicly accessible views of the Bay or other scenic vistas. The Yosemite Slough bridge as proposed under the Project would not adversely impact long- or short-range views of the Bay or other scenic vistas. Therefore, this Alternative would not substantially reduce impacts to scenic vistas by not including the bridge.

Views of the East Bay and the Bay from the Project site would be maintained within public access areas, as well as at City and State parks located within Candlestick Point. Similarly, development of HPS Phase II would not substantially block views of scenic vistas, including the Bay. Views of the East Bay and the Bay from HPS Phase II would be maintained on the site and within public access areas, such as from HPS Phase I Hilltop Park. Under Alternative 5, a stadium would not be constructed at HPS Phase II. Instead, residential and retail uses would be developed at the stadium site and building heights would be limited to 65 feet. Therefore, these residential and retail uses would not substantially block views of scenic vistas, including the Bay. The number of residential and retails units, as well as the square footage of area occupied by residential and retail uses, would be the same as the Project. While development of Alternative 5 would include high-rise towers similar to the Project at Candlestick Point and HPS Phase II, those towers would not be clustered and would not substantially obstruct views of the Bay or beyond from any long-range viewpoints. Therefore, similar to the Project, development under Alternative 5 would not substantially obstruct any scenic vistas, and this impact would be less than significant.

Development under Alternative 5 would not substantially damage scenic resources that contribute to a scenic public setting. Alternative 5 would include redevelopment of the Candlestick Park stadium site and associated paved and unpaved parking lots by replacing degraded urban areas and outdated residential development with new, well-designed urban development and integrated public parks. The Yosemite Slough bridge and roadway approaches would not be constructed and the appearance of the Slough would be unchanged. Scenic resources at HPS Phase II would be retained, including the Re-gunning crane. Additionally under Alternative 5, the stadium would not be constructed at HPS Phase II. The residential and retail uses that would be developed at the proposed stadium site would be limited to a height of 65 feet and would not damage or remove any identified scenic resources. Shoreline improvements at Candlestick Point and HPS Phase II would improve the aesthetic quality of the shoreline, reducing erosion,

including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 5 would not damage or remove any identified scenic resources that contribute to a scenic public setting and the impact would be less than significant.

Alternative 5 would include an overall development program similar to the Project, with the exception of the State Parks agreement; the Yosemite Slough bridge and San Francisco 49ers stadium at the HPS Phase II site would not be constructed. The State Parks agreement would not occur, resulting in less land available for development at Candlestick Point. Therefore, there would be an increase in density of development at Candlestick Point compared to the Project because the overall development area would be smaller. Alternative 5 would include seven towers at Candlestick Point, compared to 11 towers included under the Project, but the average tower height would be greater under Alternative 5 (341 feet compared to 288 feet under the Project). Compared to the Project, there would be three less towers constructed in the Candlestick Point North district and one less tower constructed in the Candlestick Point South district. In addition, as discussed above, the San Francisco 49ers stadium would not be constructed at the HPS Phase II site. Instead, residential and retail uses would be constructed on the proposed stadium site with building heights limited to 65 feet. Therefore, similar to the Project, development under Alternative 5 would change the visual character of the Project site. However, also similar to the Project, Alternative 5 would not substantially degrade the visual character or quality of the site or its surroundings. In fact, development under Alternative 5 would improve the degraded and deteriorated condition of much of the Project site. Development under Alternative 5 would replace the existing conditions with a more dense urban setting, and this would not represent an adverse change. The proposed shoreline improvements would improve the aesthetic quality of the shoreline by reducing erosion, including marsh plantings where appropriate, and removing debris. Similar to the Project, implementation of Alternative 5 would not substantially degrade the visual character or quality of the Project site or its surroundings. The impact would be less than significant.

Without a State Parks land agreement, there would be no established funding mechanism for future maintenance of the State Parks on site from the Project Applicant. Furthermore, increased use of the CPSRA as a result of population and employment growth associated with Alternative 5 is anticipated. Therefore, increased use of the CPSRA without an established mechanism for future maintenance of the CPSRA could result in deterioration of the CPSRA. This could potentially result in a substantial adverse impact on the visual character and quality of the Project site. Without an established funding mechanism to address the increased use, improvements and maintenance of the CPSRA would be the responsibility of CDPR. Therefore, development of Alternative 5 could result in a new adverse impact to the land use character of the CPSRA, unless a funding mechanism is established.

Development under Alternative 5 would increase lighting on the Project site relative to existing outdoor lighting and new building surfaces and would increase the level of illumination in the area. Area lighting would illuminate larger areas that are well traveled so as to promote way finding and provide for a safe environment. In addition to area lighting, building lighting would be angled towards building surfaces for aesthetic purposes and/or to illuminate signs. Like the Project, both types of lighting would be designed to avoid direct visibility of the light source. Resolution 9212 prohibits the use of highly reflective or mirrored glass in new construction. Implementation of the identified mitigation measures (MM AE-7a.1, MM AE-7a.2, MM AE-7a.3, and MM AE-7a.4) and compliance with City Resolution 9212 would reduce impacts from light and glare to a less-than-significant level by shielding lighting fixtures, minimizing spill light, screening vehicle

headlights to the maximum extent feasible, and eliminating or minimizing increased glare by the use of non-reflective glass and non-reflective textured surfaces within the proposed development area.

Potential stadium lighting impacts would be avoided because the San Francisco 49ers stadium would not be constructed.

Shadows

Development under Alternative 5 would include the same building heights, layouts, and orientations of buildings as the Project. As discussed above, the State Parks agreement would not occur resulting in less land available for development at Candlestick Point. Therefore, there would be an increase in density of development at Candlestick Point compared to the Project because the overall development area would be smaller. Alternative 5 would include seven towers at Candlestick Point, compared to 11 towers included under the Project, but the average tower height would be greater under Alternative 5 (341 feet compared to 288 feet under the Project). Compared to the Project, there would be three less towers constructed in the Candlestick Point North district and one less tower constructed in the Candlestick Point South district. Under Alternative 5, the existing public open space, Bayview Park and Gilman Park, would not be affected by new shading from development. Gilman Park would experience some shading on winter afternoons. Those shadows would be cast by buildings that do not exceed 40 feet in height, are not subject to *Planning Code* Section 295, and, therefore, would not be considered an adverse impact. No new shadow would be cast on Bayview Park. The CPSRA would be affected by new shade in the afternoon because the towers at Candlestick Point would be taller compared to the Project, but most areas would experience limited new shadow from development under Alternative 5. At HPS Phase II, the existing public open space, in the Project vicinity including India Basin Shoreline Park and India Basin Open Space, would not be affected by new shading from development under Alternative 5. Under Alternative 5, a stadium would not be constructed at HPS Phase II. Residential and retail uses would be constructed on the stadium site and building heights would be limited to 65 feet. Shadows from these uses on adjacent open space areas would be reduced compared to shadows created by the stadium. New shadows cast by development under Alternative 5 on proposed new parks throughout the year would range from little or no shading to large areas of certain parks receiving new shade, particularly in the late afternoon during the vernal and autumnal equinoxes. The extent and duration of shadow on new public sidewalks would increase along street corridors of Alternative 5. Similar to the Project, this new shadow would not be in excess of that which would be expected in a highly urban area. New shade created by implementation of Alternative 5 would occur at limited times of the day and year, and would not substantially affect the use of outdoor recreational facilities or open space. Similar to the Project, this impact would be less than significant.

Wind

Development under Alternative 5 would include structures above 100 feet in height, with maximum heights up to 420 feet, which would extend above surrounding buildings and intercept a large volume of wind. Alternative 5 would include seven towers at Candlestick Point, compared to 11 towers included under the Project, but the average tower height would be greater (341 feet compared to 288 feet under the Project). Because of the exposure of tall structures to wind, the tower structures proposed under Alternative 5 would have the potential to accelerate winds in nearby pedestrian sidewalk areas or public open space areas. The degree of change in pedestrian-level wind conditions would be influenced by

building design, such as building height, shape, massing, setbacks, and location of pedestrian areas. Structures nearing or over 100 feet in height could have effects on pedestrian-level conditions such that the wind hazard criteria of 26 miles per hour for a single hour of the year would be exceeded. Similar to the Project, the street grid of Alternative 5 would not align with predominant west and west-northwest wind directions and would, therefore, not result in channeling of winds along street corridors. The street grid would orient building faces such that they would not face into the prevailing wind direction; that orientation would reduce potentially significant pedestrian-level wind acceleration at the Project site.

Implementation of the identified mitigation measure (MM W-1a) would reduce the potential impact from wind for development of Alternative 5 by requiring review of all buildings that could result in adverse wind impacts by a qualified wind consultant. Exceedances of the wind hazard criteria, the design must be revised to reduce the impact below the established threshold. Implementation of required design changes, if any, would reduce potential hazardous wind effects at the pedestrian level by forcing wind downwash to tops of podium areas and/or into the street and away from pedestrian areas. Compliance with the mitigation measures would ensure pedestrian safety in pedestrian-access areas. Similar to the Project, through implementation of the identified mitigation measure, wind impacts would be less than significant. Elimination of the bridge would not change any of the Project's potential wind impacts.

Air Quality

As the footprint of development, the total amount of development, and the land uses provided with a Alternative 2 would be the virtually the same as the Project (with the exception of the stadium at HPS Phase II), air quality impacts of Alternative 5 would also be the same as the Project.

Construction activities for Alternative 5 would generate dust; however, they would need to comply with the San Francisco Health Code and BAAQMD requirements. Implementation of MM HZ-15, which would require the Applicant to ensure that construction contractors comply with the dust control strategies included in an approved dust control plan as part of a site-specific dust control plan, would reduce the impacts caused by construction dust to a less-than-significant level.

Construction activities could also create DPM; however, as the development of Alternative 5 would be substantially the same as the Project, implementation of mitigation measures MM AQ-2.1 and MM AQ-2.2, accelerated emission control implementation on construction equipment, would keep this impact less than significant. Construction activities could also generate toxic air contaminant (TAC) containing PM_{10}; however, as construction activities for Alternative 2 would be substantially the same as for the Project, this impact would be less than significant.

Operational emissions associated with Alternative 5 would be the same as those of the Project, therefore the mass emissions would exceed the BAAQMD CEQA thresholds, and this impact would remain significant and unavoidable, similar to the Project. Alternative 5 has the same R&D square footage, therefore potential TAC emissions from facilities in R&D areas would be the same as the Project. With the implementation of mitigation measures MM AQ-6.1 and MM AQ-6.2, this impact would be less than significant.

Additionally, as the scale of Alternative 5 is virtually the same as the Project, the impacts from Alternative 5 traffic (e.g., carbon monoxide and $PM_{2.5}$) would be less than the Project and therefore continue to be less than significant.

According to the current BAAQMD CEQA Guidelines, odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD regards with potential to generate considerable odors include: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries and chemical plants. Alternative 5 would be a large mixed-use development containing residential, office, retail, R&D, recreational, and entertainment uses. Although there may be some potential for small-scale, localized odor issues to emerge around proposed sources such as solid waste collection, food preparation, etc., substantial odor sources and consequent effects on on-site and off-site sensitive receptors would be unlikely and would be resolved by interventions after receipt of any complaints. This would be a less-than-significant impact. No mitigation is required.

The Project is consistent with regional air quality plans; therefore, as Alternative 5 being the same size as Project would remain consistent with these plans. Alternative 5 promotes the use of alternative transportation modes, such as transit, biking and walking. In addition, it puts housing in close proximity with jobs and retail establishments, reducing the length of trips and further reducing reliance on single-occupancy vehicles. Therefore, Alternative 5 conforms to the regional air quality plan and there would be a less-than-significant impact. No mitigation is required.

Noise

Alternative 5 would remove the stadium proposed under the Project and relocate 1,350 residential dwelling units from Candlestick Point to HPS Phase II, and the State Parks agreement would not occur. Other than the stadium site and elimination of State Parks open space, land uses provided with Alternative 5 would be the same as the Project. As land uses would remain the same, the potential noise impacts would be the same as the Project with the exception that the noise impact from operation of the stadium would not occur under Alternative 5.

Construction activities for Alternative 5 would expose sensitive receptors to increased noise levels on the site and in existing residential neighborhoods adjacent to the site. Construction activities would need to comply with the San Francisco Noise Ordinance, which generally prohibits construction between 8:00 P.M. and 7:00 A.M. and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 feet. Implementation of mitigation measures MM NO-1a.1 and MM NO-1a.2, which would require implementation of construction Best Management Practices to reduce construction noise and the use of noise-reducing pile driving techniques, would reduce any potentially significant impacts to less-than-significant levels, similar to the Project.

Construction activities for Alternative 5 would result in a temporary or periodic increase in ambient noise that would be noticeable and likely cause for human annoyance. Construction activities would occur within 25 feet of existing and future residential uses. Pile driving activities could result in substantial noise levels of up to 107 dBA at new residential uses on the site or at adjacent existing residences. Construction-related temporary increases in ambient noise levels would be considered significant and unavoidable, the same as for the Project.

Construction activities could also create excessive ground-borne vibration levels in existing residential neighborhoods adjacent to the site and at proposed on-site residential uses, should the latter be occupied before construction activity on adjacent parcels is complete. Implementation of mitigation measures MM NO-1a.1, MM NO-1a.2, and MM NO-2a would require implementation of construction Best

Management Practices, noise-reducing pile driving techniques as feasible, and monitoring of buildings within 50 feet of pile driving activities. Implementation of these measures would reduce vibration impacts under Alternative 5, but not to a less-than-significant level, as vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North District; therefore, this impact would remain significant and unavoidable, similar to the Project.

Daily operation of Alternative 5, such as mechanical equipment and delivery of goods, would not expose noise-sensitive land uses on- or off- site to noise levels that exceed the standards established by the City of San Francisco. This impact would be less than significant, similar to the Project. Operation activities associated with Alternative 5, such as delivery trucks, would not generate or expose persons on or off site to excessive groundborne vibration. This impact would also be less than significant, similar to the Project.

Operation of Alternative 5 would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. Noise level increases associated with Alternative 5 would be similar to those shown for the Alternative 5 which also shifts residential uses and does not include the stadium at HPS Phase II, are shown in Table IV-21 (Modeled Noise Levels along Major Project Site Access Roads – Housing Variant) of Chapter IV. According to the noise models, impacts would be significant along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, similar to the Project. However, there would be slightly lower noise levels than the Project along Carroll Avenue, Gilman Avenue, and Jamestown Avenue, but would still be significant.

Because Alternative 5 would not include a football stadium at HPS Phase II and the stadium at Candlestick Point, noise impacts identified for the Project from football games and concerts would not occur with implementation of Alternative 5. Noise generated from the existing stadium is considered an existing condition and would not be considered an impact of the Project.

Cultural Resources

Alternative 5 would not change the significance of any historic structures at Candlestick Point because no historic resources have been identified at Candlestick Point. Similar to the Project, implementation of Alternative 5 would retain Drydocks 2 and 3 and rehabilitate Buildings 140, 204, 205, and 207 at the HPS Phase II site in accordance with the Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. However, development under Alternative 5 would result in the demolition of Buildings 211, 231, and 253, which are historic resources in the CRHR-eligible Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. This would result in a significant impact because the proposed actions would materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR. Implementation of the identified mitigation measures (MM CP-1b.1 and MM CP-1b.2) would reduce those impacts; however, the demolition of historic resources would not reduce impacts to a less-than-significant level. Therefore, similar to the Project, the impacts to these historical resources, created by developing Alternative 5, would be a significant and unavoidable.

Construction activities associated with Alternative 5 could result in a substantial adverse change in the significance of archaeological resources. The Project site overall is likely to contain subsurface archaeological resources from the Native American, Chinese fishing village, prehistoric, and maritime development periods. Similar to the Project, construction activities associated with Alternative 5 could

disturb those archaeological resources, and result in potentially significant impacts. Implementation of the identified mitigation measure (MM CP-2a) would reduce the effects on archaeological resources to a less-than-significant level. The Yosemite Slough bridge would be eliminated and potential disturbance of archaeological resources resulting from bridge construction would be avoided.

Construction activities associated with Alternative 5 could result in a substantial adverse change in the significance of paleontological resources. Under Alternative 5, the development footprint at Candlestick Point would be smaller than the Project and the development footprint at HPS Phase II would be greater than the Project. The Bay mud underlying portions of the fill is expected to contain paleontological resources. Similar to the Project, implementation of the identified mitigation measure (MM CP-3a) would reduce the effects of construction-related activities to potential paleontological resources in in-water and off-site areas to a less-than-significant level for development under Alternative 5. The Yosemite Slough bridge would be eliminated and potential disturbance of paleontological resources resulting from bridge construction would be avoided.

Hazards and Hazardous Materials

Under Alternative 5, the development footprint at Candlestick Point would be smaller than the Project because the State Parks land agreement would not occur, thereby making less land available for development. The development footprint at HPS Phase II would be greater than the Project. However, extensive construction would occur in locations similar to the Project and would have potential impacts related to exposure to hazardous materials similar to the Project, as presented below.

Under Alternative 5, the construction impacts associated with Hazards and Hazardous Materials would be reduced as compared to the Project because the overall development footprint would be smaller, as there would be no State Parks land agreement or Yosemite Slough bridge. This reduced development would result in a smaller area subject to disturbance.

Site preparation would include deep excavations for large structures such as for residential towers, with plans to use the cut material elsewhere within the Project site as fill, trenching for utility lines, dewatering, grading and compaction and other earth-disturbing activities. As portions of the site are known to contain elevated levels of chemicals in the soil, construction activities could result in exposure of construction workers, the public or the environment to unacceptable levels of hazardous materials if not handled appropriately. MM HZ-1a would reduce effects related to exposure of known contaminants at Candlestick Point by requiring compliance with Article 22A or an equivalent process. At HPS Phase II, potential effects related to exposure to hazardous materials from construction activities would be mitigated through requirements to comply with restrictions imposed on the property through the federal site clean-up process (MM HZ-1b, MM HZ-9, and MM HZ-12). Disturbance of contaminated soil, sediments, and groundwater in the shoreline areas at HPS Phase II, although reduced in scope with the elimination of the Yosemite Slough Bridge, would still occur as a result of shoreline improvements. MM HZ-10b would ensure approval of workplans by the Navy and regulatory agencies prior to any work in the shoreline areas. In addition, mitigation measures MM HY-1a.1, MM HY-1a.2, MM BI-4a.1, MM BI-4a.2, and MM BI-5b.4 would reduce water quality and biological resources impacts from disturbance of contaminated soil, groundwater and sediments.

At both Candlestick Point and HPS Phase II, compliance with MM HZ-2a.1 would require the preparation and implementation of contingency plans to address unknown contaminants that might be encountered during construction, and compliance with MM HZ-2a.2 would require preparation and implementation of health and safety plans to protect construction workers from exposure to hazardous materials during construction activities. Construction activities could require off-site transport of contaminated soil or groundwater; compliance with federal, state, and local regulations would ensure that no unacceptable exposure to chemicals occur as a result of these activities. Further, mitigation measures MM HY-1a.1, MM HY-1a.2, and MM HY-1a.3 would ensure that no unacceptable levels of hazardous materials in soil in surface runoff or in groundwater are discharged to the sewer system or discharged from the site to the Bay. Hazardous materials impacts from all of the above construction-related activities would be reduced to less than significant with the implementation of the mitigation measures identified above, the same as for the Project.

Development under Alternative 5, as for the Project, would require the installation of foundation support piles, which could, under certain soil conditions, create a vertical conduit for chemicals occurring in shallow groundwater to migrate to the deeper groundwater aquifer. However, MM HZ-5a, which requires preparation of a plan for pilot boreholes for each pile to prevent disturbance of potentially contaminated fill materials and would reduce this potential impact from pile driving to less than significant, the same as for the Project.

Elimination of construction of the Yosemite Slough Bridge would avoid impacts associated with disturbance of potentially radiologically impacted soils at HPS Phase II in the vicinity of Parcels E and E-2, thus reducing the potential for exposure to hazardous materials in soil or groundwater in this area.

Alternative 5 would place housing on the HPS Phase II site. The Navy's cleanup plan is designed to remediate the HPS site to levels acceptable for the planned uses in the existing HPS Redevelopment Plan. To the extent that Alternative 5 proposes to place housing in areas not designated for residential use in the existing HPS Redevelopment Plan, additional hazardous materials remedial work could be required, which could result in some increased risk to workers, the public and environment from exposure to hazardous materials during the construction process. Any property that has not been remediated for unrestricted use at the time of transfer will have use restrictions placed on the property in compliance with the federal clean-up process. For use restrictions to be removed, the Project Applicant would be required by the transfer documents to obtain approval from the regulatory agencies overseeing the clean-up process before residential uses could be placed on these portions of the site. Any remedial activities undertaken as part of the construction process would be subject to the requirements in MM HZ-1b, which requires construction activities at HPS Phase II to be done in accordance with all restrictions imposed on the site by the federal regulatory clean-up process and these impacts would be less than significant, the same as for the Project.

Potential impacts associated with disturbance of naturally occurring asbestos would be similar to those associated with the Project and would be mitigated through MM HZ-15, which requires the preparation of dust control plans as required by BAAQMD and DPH. Alternative 5 would involve the demolition of existing structures that may contain asbestos-containing building materials, lead-based paint and other hazardous materials, the same as the Project. The existing regulatory framework and approval process would avoid potential hazards from demolition or building preservation activities and impacts would be less than significant, the same as the Project.

Alternative 5 would involve off-site roadway improvements, which could result in disturbance of hazardous material in soil or groundwater. Unacceptable exposures would be controlled as for the Project by implementation of MM HZ-1a, and hazardous materials impacts from these activities would be less than significant.

Project operations would involve routine use, storage, transport, or disposal of hazardous materials. The use of such materials would be the same as for the Project, as the development program is essentially the same. Compliance with applicable federal, state, and local regulations related to the use, storage and transport of such materials would result in a less-than-significant impact from hazardous materials usage, the same as for the Project.

Geology and Soils

Construction activities, such as removal of paved areas, grading, and excavation, could remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. However, requirements to control surface soil erosion during and after construction of Alternative 5 would be implemented through the requirements of the identified mitigation measure (MM HY-1a.1), and adverse effects on the soil such as soil loss from wind erosion and stormwater runoff would be reduced to a less-than-significant level. Soil erosion impacts associated with construction of the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 5.

Construction activities would have the potential to affect groundwater levels. Construction may include dewatering procedures during excavation, construction, and operation of foundations and buried utilities. The dewatering could cause settlement of adjacent soils that could damage the overlying foundations of existing buildings. With implementation of the dewatering techniques, groundwater level monitoring, and subsurface controls as specified in the SFBC and required by the identified mitigation measure (MM GE-2a), groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Similar to the Project, settlement hazards related to dewatering would be less than significant for development under Alternative 5.

Development of Alternative 5 would require rock removal activities at the Alice Griffith and Jamestown districts that could result in damage to structures from vibration or settlement caused by the fracturing of bedrock for excavation. With implementation of the identified mitigation measure (MM GE-3), vibration from controlled rock fragmentation in the area would not cause unacceptable settlement at adjacent or nearby properties. Similar to the Project, settlement hazards related to controlled rock fragmentation would be less than significant for development under Alternative 5.

The potential for exposure to adverse effects caused by seismic groundshaking and seismically induced ground failure such as liquefaction, lateral spreading, landslides and settlement exists at the Project site. The identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, and MM GE-6a) would require design-level geotechnical investigations for development under Alternative 5. Design-level geotechnical investigations must include site-specific seismic analyses to evaluate the peak ground accelerations for design of structures, as required by the SFBC through review by DBI. The structural design review would ensure that all necessary mitigation methods and techniques are incorporated in the design for foundations and structures to reduce potential impacts from ground failure

or liquefaction to a less-than-significant level for development under Alternative 5. Seismic-related groundshaking hazards associated with the Yosemite Slough bridge would be avoided because the bridge would not be constructed under Alternative 5.

The existing shoreline exhibits active erosion and consists of areas of unprotected slopes and dilapidated naval pier and wharf structures. Similar to the Project, Alternative 5 would include numerous shoreline improvements, including additional concrete revetments, creation of new beach and tidal habitat, and some grading and importation of fill at certain locations. These improvements would improve the stability of the shoreline. Therefore, Alternative 5 would not result in the exposure of structures and facilities at the Project site to substantial adverse effects caused by shoreline instability. Similar to the Project, the impact would be less than significant.

The potential for adverse effects caused by landslides, settlement, expansive and corrosive soils, exists at the Project site. Site-specific, design-level geotechnical investigations would be required to be submitted to DBI in connection with permit applications for individual elements of development for Alternative 5, as specified in the identified mitigation measures (MM GE-4a.1, MM GE-4a.2, MM GE-4a.3, MM GE-5a, MM GE-6a, MM GE-10a, MM GE-11a) for the Project. The site-specific analyses must assess these conditions and prescribe the requirements for foundations on slopes in accordance with the SFBC. All geotechnical investigations and permits must be approved by DBI. With implementation of those mitigation measures, impacts with regards to landslides, settlement, and expansive and corrosive soils would be less than significant. Potential ground failure impacts associated with construction of the Yosemite Slough bridge and the stadium would be avoided because the bridge and stadium would not be constructed under Alternative 5.

Hydrology and Water Quality

The footprint of development for Alternative 5 would be reduced compared to the Project, because no State Parks agreement would occur and the Yosemite Slough Bridge would not be constructed. The extent of development would be reduced compared to the Project, because the stadium would not be constructed, and portion of residential uses proposed at Candlestick Point under the Project would be shifted to HPS Phase II. As a result, at Candlestick Point the density of development would increase and the extent of development would be reduced compared to the Project. At HPS Phase II, the density and extent of development would remain similar to the Project, as residential development would increase by 1,350 units in place of the stadium. As such, impacts from construction of the Alternative 5 would be less than the Project. With residential uses being shifted from Candlestick Point to HPS Phase II, replacing the stadium and associated parking lots, the total amount of development would be reduced, and the extent of impervious surfaces would be reduced as the footprint of development for Alternative 5 would be reduced compared to the Project and development densities would be greater. Thus, operational impacts to hydrology and water quality would be less than the Project.

With adherence to applicable regulatory requirements, construction activities associated with Alternative 5 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to sediment-laden runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With reduced overall development, impacts would be less than the Project, however mitigation measures

proposed under the Project would be still be applicable. With implementation of mitigation measures MM HY-1a.1 (preparation of a Storm Water Pollution Prevention Plan—SWPPP—for discharges to the combined sewer system), MM HY-1a.2 (SWPPP preparation for separate storm sewer systems), and MM HY-1a.3 (construction dewatering plan) impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 5 would include excavation for building foundations and underground utilities which could require short-term and/or long-term dewatering of the affected areas. As no extensive underground space is proposed for Alternative 5, the installation of underground building elements and utilities would not substantially alter groundwater levels, similar to the Project. As such, Alternative 5 would not substantially deplete groundwater supplies and would result in a less than significant impact, similar to the Project. As the total amount of open space under Alternative 5 is reduced compared to the Project, the amount of permeable surface within the Project footprint would also be less. Although, the State Parks agreement would not occur, the existing open space accounted for under the Project would remain. Therefore, Alternative 5 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. This impact would be less than significant, similar to the Project.

No streams or rivers are currently located within Alternative 5 site and thus no streams or rivers would be altered by construction activities. Under existing conditions, stormwater typically drains to storm drains (which include both combined and separate systems) or directly to the Bay via surface runoff (generally only along portions of the shoreline). During construction of Alternative 5, the existing drainage patterns within the area would generally be preserved. Construction activities associated with Alternative 4 would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding on or off site. Impacts would be less than significant, similar to the Project.

Construction activities associated with Alternative 5, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat on-site stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. With compliance with regulatory requirements, as required by mitigation measures MM HY-1a.1 and MM HY-1a.2 (preparation of an SWPPP) impacts would be less than significant, similar to the Project.

Operation of Alternative 4 would not contribute to violations of water quality standards or waste discharge requirements or otherwise degrade water quality. Compliance with the requirements of the Municipal Stormwater General Permit, the Recycled Water General Permit, and the Industrial General Permit would reduce potential water quality impacts associated with implementation of Alternative 4. In addition, Alternative 5 would be required to comply with the San Francisco SWMP, the Draft San Francisco Stormwater Design Guidelines, and the San Francisco Green Building Ordinance. Compliance with these requirements would be demonstrated in the SDMP or SCP for the project site, as required by mitigation measure MM HY-6a.1. Compliance with the Recycled Water General Permit would be required by implementation of mitigation measure MM HY-6a.2. To reduce the potential for stormwater infiltration to mobilize historic soil contaminants at HPS Phase II, the use of infiltration BMPs would be prohibited by mitigation measure MM HY-6b.1. To reduce stormwater runoff impacts associated with industrial activities

at HPS Phase II, compliance with the Industrial General Permit would be required by implementation of mitigation measure MM HY-6b.2. To reduce stormwater impacts associated with maintenance dredging of the marina, compliance with the DMMO regulatory requirements would be required by implementation of mitigation measure MM HY-6b.3. Compliance with the Clean Marinas California Program would be required by implementation of mitigation measure MM HY-6b.4. As the extent of impervious surfaces for Alternative 5 would be reduced than the Project, impacts would be less than the Project.

Development under Alternative 5 would also not utilize groundwater as a source of water supply nor interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level and no impact would occur, similar to the Project.

Operation of Alternative 5 could alter the existing drainage pattern of the site, but would not alter the course of a stream or river, as none exist at or near the site currently, or result in substantial erosion, siltation, or flooding on or off site similar to the project. Implementation of Alternative 5 would not contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff, as development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the Bay. Compliance with regulatory requirements, including the submission of a SDMP and SCP to the SFPUC for approval, as required by mitigation measure MM HY-6a.1, would ensure that this impact would be less than significant, similar to the Project.

Implementation of Alternative 5 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Implementation of mitigation measures MM HY-12a.1 (Finished Grade Elevations above Base Flood Elevation) and MM HY-12a.2 (Shoreline Improvements for Future Sea-Level Rise) would reduce this impact to a less-than-significant level, similar to the Project.

Implementation of Alternative 5 would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Implementation of mitigation measure MM HY-14 (Shoreline Improvements to Reduce Flood Risk) would reduce impacts to a less-than-significant level. Based on historical records and the location of development, Alternative 5 would not expose people or structures to inundation by seiche, tsunami, or mudflow. These impacts would be less than significant, similar to the Project.

Biological Resources

Similar to the Project, Alternative 5 would involve removal and/or modification of areas that have the potential to contain special-status species, including: seven potentially breeding avian species, one bat species, and four fish species (green sturgeon, Chinook, steelhead, and longfin smelt). Alternative 5 would also have the potential to affect designated critical habitat of the green sturgeon and Central California Coast steelhead and thus, directly impact threatened and/or endangered species through habitat conversion or unauthorized take. In addition, activities would occur within habitats of locally rare or sensitive species such as Pacific herring and Olympia oysters, as well as avian species protected by the MBTA. Elimination of the Yosemite Slough bridge would avoid potential impacts to adverse effects to special-status species in and around Yosemite Slough. Alternative 5 would include implementation of the ecological design features described in the Project's Draft Parks, Open Space, and Habitat Concept Plan that would result in multiple

measures to avoid, limit, and mitigate for impacts to special-status and legally protected species. Specifically, the design components would remove invasive species; restore, preserve, and enhance wetland, aquatic, and grassland habitats; revegetate the site with extensive planting of trees and shrubs; increase the vegetative cover for foraging and dispersing animals; and maintain and enhance habitat connectivity along the shoreline. Alternative 5, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-6a.1, MM BI-6a.2, MM BI-6b, MM BI-7b, MM BI-9b, MM BI-18b.1, and MM BI-18b.2) and ecological design features, would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFG or USFWS. Impacts would be less than the Project, and, similar to the Project, impacts would be less than significant after mitigation for development under 5.

Development of Alternative 5 could have a substantial adverse effect on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG or USFWS. The only sensitive habitats other than wetlands and aquatic habitats are eelgrass and areas designated as EFH. Elimination of the Yosemite Slough bridge would avoid potential adverse effects to sensitive natural communities and their habitats in and around Yosemite Slough. Shoreline improvements, shoreline abutments for the proposed marina, and installation of the breakwater at HPS Phase II could have substantial adverse impact to the communities. However, with implementation of the identified mitigation measures (MM BI-4a.2, MM BI-5b.1 through MM BI-5b.4, MM BI-12b.1, MM BI-12b.2, MM BI-12b.3, MM BI-18b.1, MM BI-18b.2, MM BI-19b.1, and MM BI-19b.2), impacts of Alternative 5 on sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG, NMFS, or USFWS would be reduced to a less-than-significant level. Potential impacts to eelgrass beds would be the same as the Project (eelgrass beds are not located near Yosemite Slough), while impacts to EFH would be less than the Project since construction associated with Yosemite Slough bridge would be avoided and, thus, EFH would not be impacted through the construction of pilings required to support the bridge.

The shoreline improvements included Alternative 5 would be similar to the Project and could have substantial temporary and permanent adverse effect on federally protected wetlands and other waters as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. . Those impacts would be substantially reduced compared to the Project because the Yosemite Slough bridge would not be constructed. As a result, impacts to approximately 0.70 acre of other waters, 0.01 acre of tidal salt marsh, and 0.96 acre of shadow fill would be avoided. The identified mitigation measures would reduce the effects of construction-related activities to wetlands and other waters by mitigating for the temporary and permanent loss of the wetlands and jurisdictional waters through avoidance of impacts, requiring compensatory mitigation (i.e., creation, preservation, and/or restoration), obtaining permits from the USACE, SFRWQCB, and BCDC that are designed to protect wetlands and jurisdictional waters, and implementing construction BMPs to reduce and/or prevent impacts to waters of the United States, including wetlands and navigable waters. With implementation of the identified mitigation measures (MM BI-4a.1 and MM BI-4a.2), the impacts of development under Alternative 5 to federally protected wetlands and other waters as defined by Section 404 of the CWA would be reduced to a less-than-significant level, similar to the Project. However, impacts would be less than the Project.

Development of Alternative 5 could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site. The Project site is surrounded by open water and urban development and no major drainages, canyon bottoms, ridgetops, rivers, creeks or areas that provide substantial movement corridors or migratory pathways occur within the Project site. However, similar to the Project, implementation of Alternative 5 would place new residential towers and a stadium with light towers along a portion of the San Francisco Bay shoreline. The increase in strike hazards from the tall buildings and the potential for lighted stadium towers to alter flight paths could substantially interfere with migratory avian flight paths, which would be considered a potentially significant impact to migratory birds. Compared to the Project, the strike hazard related to the stadium light towers would be avoided because no stadium would be constructed. With respect to aquatic species, although migratory fish could continue to move though the open water and Yosemite Slough, the Project site does not contain any substantial migratory fish pathways such as anadromous fish streams. Elimination of the Yosemite Slough bridge would avoid adverse effects to special-status aquatic species and their habitats in and around Yosemite Slough. However, construction of breakwaters and other shoreline treatments in HPS Phase II would occur near eelgrass beds, which could directly or indirectly impact eelgrass beds such that productivity and survival of these habitats would be substantially reduced. Similar to the Project, with implementation of the identified mitigation measures (MM BI-5b.1 through MM BI-5b.4, MM BI-20a.1, and MM BI-20a.2), the potential impacts of Alternative 5 would be reduced to a less-than-significant level because it would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Similar to the Project, Alternative 5 would be required to comply with mitigation measure MM BI-14a to ensure that Project development would not result in conflicts with the City's tree protection ordinances. With implementation of MM BI-14a, Alternative 5 would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant, similar to the Project.

Public Services

Police Protection

During construction of Alternative 5, emergency access to the Project site would be maintained through compliance with the CTMP. The purpose of a CTMP is to ensure that the impacts of construction on the public domain, in particular with respect to temporary interruptions to vehicular and pedestrian traffic, are considered and addressed. Because Alternative 1 would include the same mitigation as the Project, there would be a similar requirement to prepare a CTMP for Alternative 5 that would address temporary impacts on circulation during construction. The CMTP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. Construction activities associated with implementation of Alternative 5 also could increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. To ensure adequate site security, mitigation measure MM PS-1 would require the Project Applicant to provide security during construction. Therefore, this impact would be less than significant, the same as for the Project.

Implementation of Alternative 5 would increase resident and employee population at the Project site resulting in a potential increase in the need for 53 additional police personnel to provide a comparable level of service to existing conditions. The SFPD evaluates the need for additional officers by sector, and not station or district needs. While it is unlikely that 53 new officers would be needed, some redistribution of the police presence in the southeastern portion of the City would be warranted by development of Alternative 5.

If the SFPD determines that the reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility of approximately 6,000 sf could be constructed within the Project site, on land designated for community-serving uses. As part of the this Alternative, up to 100,000 gsf of land divided equally between Candlestick Point and HPS Phase II would be designated for community-serving uses including a police station. Construction of a new SFPD facility (counter, storefront, or other configuration) within these community services uses and/or the reconfiguration or expansion of the existing Bayview Station would be funded by the Project Applicant. Similar to the Project, Alternative 5 includes community service use areas, and as construction would be funded by the Project Applicant, the SFPD would maintain acceptable levels of police service. Therefore, development of this Alternative would not require new or physically altered police facilities beyond the scope of the Project in order to maintain acceptable police services. This impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Fire and Emergency Medical Services

Alternative 5 would add 10,500 residential units and substantially increase employment-generating uses, resulting in an employment population of 10,730. The increase in the residential and daytime employment population (for a total population of 35,195, including residential population of 24,465 plus 10,730 employees), combined with an increase in the intensity of physical development on the Project site, would result in new demand for fire protection and emergency medical services.

During construction of Alternative 5, emergency access to the Project site would be maintained through compliance with the CTMP, as required by mitigation measure MM TR-1. Construction of a new SFFD facility on land designated for community-serving uses on the Project site (where costs would be borne by the Project Applicant), would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. Similar to the Project, construction of 100,000 gsf of community facilities, which would include a new SFFD facility, would be included as a component of Alternative 5. As no stadium would be constructed, there would be no demand for additional emergency services on game days. Therefore, development under Alternative 5 would not require new or physically altered fire protection facilities to maintain acceptable response times. Additionally, compliance with all applicable provisions of the *San Francisco Fire Code* would ensure that this impact is considered less than significant.

The bridge over the Yosemite Slough under the Project would offer a direct, separated right-of-way between Candlestick Point and HPS Phase II that would not be available under this alternative. This could result in an increase in response times compared to the Project, and could be a potentially significant impact not occurring with the Project.

Schools

A total of approximately 2,131 school-age children would live within the Project site following full build-out of Alternative 5. While schools in the Project vicinity have approximately 49 percent capacity remaining in the 2008-2009 school year, it is likely that a 12 percent overcapacity of SFUSD as a result of citywide population growth in 2030 would occur. Similar to the Project, the payment of school impact fees pursuant to SB50 would constitute full mitigation for any potential schools impacts. This impact is considered less than significant for development under Alternative 5.

Libraries

Construction of Alternative 5 would not result in impacts to the SFPL. No library branches are located on the Project site. All library services would be available to the community throughout the duration of construction. As such, no impact to library services during construction of Alternative 5 would occur.

Residential and nonresidential development associated with Alternative 5 would increase demand for local library services in the Bayview neighborhood. Although this Alternative would result in a substantial direct and indirect population increase within the Bayview neighborhood, library branches serving the Project site, including the Portola, Visitacion Valley, and the Bayview branches would continue to meet the demands of the community. In addition to the three library branches serving Alternative 5, the proposed development would include space dedicated to library services to supplement the Bayview branch library. As part of Alternative 5, a 1,500-gsf reading room and automated book-lending machines would be integrated into the community retail and public facilities uses. The SFPL branches, and the dedication of space to accommodate library services on the Project site in order to supplement SFPL branches, would accommodate increased demand from development under this Alternative. No additional library facilities would be required to accommodate development of Alternative 5. Therefore, no new or physically altered library facilities would be required in order to maintain acceptable service ratios and this impact is considered less than significant for development under Alternative 5.

Recreation

Implementation of Alternative 5 would include parks and open space areas similar to the Project, except it would not include a State Parks land agreement, resulting in a different configuration of parks at Candlestick Point. Compared to the Project, the CPSRA would remain 120.2 acres, compared to the 23.5-acre reduction under the Project. Neighborhood parks would be constructed within the Candlestick Point districts, but the total area would be reduced compared to the Project. Construction activities associated with the proposed parks and recreational facilities are considered part of the overall development footprint. Since this Alternative is similar to the Project, construction impacts anticipated to result from implementation of this Alternative are analyzed throughout the technical sections of this EIR. Such impacts would be temporary and would be mitigated by measures identified in Section III.D, Section III.H, Section III.I, and Section III.K, Section III.M, and Section III.N. These measures address construction-related impacts including, but not necessarily limited to, traffic and circulation, air quality, noise, exposure to hazardous material, and soil erosion, which would help reduce potential impacts to recreational resources. In addition, because the State Parks land agreement would not occur, the improvements to the CPSRA as proposed under the Project would not be constructed. Therefore, construction activities at Candlestick Point would be reduced and construction impacts associated with development of new parks and recreational facilities would be less than significant.

At build-out of Alternative 5, the projected population within the Project site would increase from approximately 1,113 residents to approximately 24,465 residents, while employment would increase from 529 jobs to approximately 10,730 jobs. Compared to the Project, the CPSRA would remain 120.2 acres, compared to the 23.5-acre reduction under the Project. Similar to the Project, parks and open space included in Alternative 2 would provide a ratio of about 15.2 acres of parkland per thousand residents, which is substantially higher than the benchmark ratio of 5.5 acres per thousand residents (refer to Section III.P). A total of 5.9 acres of neighborhood parks would be constructed at Candlestick Point compared to 8.1 acres under the Project. The increase in population and employment could result in an increase in the use of existing parks, recreational facilities, and open space. During a given phase, however, park construction could lag behind residential development, leading the parkland-to-population ratio to drop below an acceptable level. Moreover, the development plan is conceptual, and could be modified during the entitlement and development process. Mitigation measure MM RE-2 would ensure that the parks and recreational amenities are constructed as residential and employment-generating uses are developed. Parks and open space at HPS Phase II would include improvements similar to the Project and would help offset the increase in demand created by new residents and employees. The 1.4-acre Alice Griffith Neighborhood Park would serve residents of the Alice Griffith Public Housing site.

Without a State Parks land agreement, there would be no established funding mechanism for future maintenance of the State Parks on site from the Project Applicant. Furthermore, increased use of the CPSRA as a result of population and employment growth associated with Alternative 5 is anticipated. Therefore, increased use of the CPSRA without an established mechanism for future maintenance of the CPSRA could result in deterioration of the CPSRA. This could potentially result in a substantial adverse impact on recreational facilities at the Project site. Without an established funding mechanism to address the increased use, improvements and maintenance of the CPSRA would be the responsibility of CDPR. Therefore, development of Alternative 5 could result in a new adverse impact on recreational facilities that would not occur under the Project.

A windsurfing launch site is located in the CPSRA. Windsurfing could potentially be impacted by the construction of tall structures in close proximity to the Bay that affect wind patterns and direction. Similar to the Project, development under Alternative 5 would include structures above 100 feet in height, with maximum heights up to 420 feet, which would extend above surrounding buildings and intercept a large volume of wind. Alternative 5 would include seven towers at Candlestick Point, compared to 11 towers included in the Project, but the average tower height would be greater (341 feet compared to 288 feet under the Project). Therefore, due to these taller building heights, impacts to windsurfing could be greater under build-out of Alternative 5.

Utilities

Water Supply

Alternative 5 would include water infrastructure similar to the Project. Impacts of construction activities associated with this infrastructure, including demolition and installation of new utility infrastructure, are discussed in Section III.D, Section III.H, Section III.I, Section III.J, Section III.K, Section III.L, Section III.M, Section III.O, and Section III.S of this EIR. No new construction impacts beyond those identified in those sections would occur with construction of water conveyance or treatment infrastructure

associated with the Project. The water required for construction activities is assumed to be supplied by water trucks and/or existing sources. No construction-related impacts associated with the consumption of water would occur with the Alternative 5.

Alternative 5 would have a similar residential and non-residential build-out compared to the Project except the San Francisco 49ers stadium would not be constructed. Because Alternative 5 would not include the stadium it would generate a total demand of approximately 1.65 mgd, 0.02 mgd less than the Project. As current water use from existing land uses at the Project site is approximately 0.3 mgd, the net effect of the Alternative 5 on water demand would be an increase of approximately 1.35 mgd.[1371] As stated in the Water Supply Assessment provided for the Project, the SFPUC projects that adequate supply would be available to satisfy all retail demand, including Project-related demand, under normal conditions (refer to Appendix Q1). Therefore, there would be sufficient water supplies to accommodate the water demand of Alternative 5. This is considered to be a less-than-significant impact. Similar to the Project, implementation of Alternative 5 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be less than significant.

Implementation of Alternative 5 would require expansion of the existing off-site AWSS by providing an AWSS loop at Candlestick Point that would connect to the planned extension of the existing off-site AWSS on Gilman Street from Ingalls Street to Candlestick Point. At HPS Phase II, the AWSS would be connected to the existing AWSS system at the intersection of Earl Street and Innes Avenue and at the Palou Avenue and Griffith Avenue intersection with a looped service along Spear Avenue/Crisp Road. Implementation of the identified mitigation measure (MM UT-2) would ensure the provision of adequate water for on-site fire-fighting purposes, and the Project would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water to fight fires. The impact is less than significant with implementation of this mitigation measure.

Wastewater

Under Alternative 5, development would discharge a total maximum peak flow of maximum peak flow of 2,417 gpm in the Hunters Point tunnel sewer (41 gpm less than the maximum peak flow of Project because the stadium would not be constructed), which has an existing unused capacity of 69,853 gpm in dry weather. This represents 3.5 percent of the available capacity of the Hunters Point tunnel sewer, which could be accommodated by the existing off-site infrastructure.

The wastewater generated under Alternative 5 would be 41 gpm less than the maximum peak flow of Project. As with the Project, it is possible that a temporary increase in CSO volume could occur during wet weather if structures are occupied and contribute wastewater to the Combined Sewer System prior to completion of the separate stormwater and wastewater infrastructure of Alternative 5. Implantation of the identified mitigation measure (MM UT-3a) would ensure that there would be no increase in CSO flows as a result of the Project by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for the Project. The impact on the Combined Sewer System would be reduced to less than significant.

[1371] Water demand for this alternative was estimated by prorating water demand for the Project (presented in Table III.Q-4) based on build-out of Alternative 5.

The wastewater generated under Alternative 5 would be less than the Project. The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the Project development. Overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows, assuming completion of utility infrastructure prior to occupancy of Alternative 5. Based on this analysis, the overall volumes in the Bayside system during wet weather would be less than under existing conditions with implementation of Alternative 5. It is possible that a temporary increase in CSO volume could occur (which could affect the capacity of the SWPCP for treatment) during wet weather, as noted, above. Implantation of the identified mitigation measure (MM UT-3a) would reduce this impact to less than significant by providing temporary detention or retention of wastewater on site during wet weather or completion of the separate stormwater and wastewater systems for Alternative 5. Thus, Alternative 5 would not result in any net increase in CSO volume in the Bayside system during wet weather. A less-than-significant impact to existing off-site treatment facilities would occur.

Development associated with Alternative 5 would incrementally contribute wastewater during dry and wet-weather events to the Combined Sewer System operated by the SFPUC, but overall, wet-weather volumes would decrease in the Bayside system with construction of the alternative's separate stormwater and wastewater systems. Compliance with any applicable permit requirements, as monitored and enforced by the SFPUC, would ensure that the Alternative 5 would not exceed the applicable wastewater treatment requirements of the RWQCB. In addition, Alternative 5 would not cause the City to exceed the requirements of the NPDES permit for the reasons previously stated and because the flows during wet weather would actually decline compared to existing flows from the Project site. This impact would be less than significant.

Solid Waste

Demolition of existing facilities within the Project site under Alternative 5 would generate approximately 971,785 tons of construction debris. Some construction and demolition debris would be reused on site, while other materials would be transported off site for separation. Materials that cannot be reused or recycled would be transported to the landfills in the area. With implementation of the identified mitigation measure (MM UT-5a), the Project Applicant would be required to submit a Waste-Diversion Plan demonstrating strategies to divert at least 75 percent of total construction wastes before receiving building permits. This would reduce construction debris transported to the landfill to 25 percent, or 242,946 tons. At an average density of 1 ton per cubic yard, this equals 242,946 cubic yards, or 0.5 percent of the available capacity at Altamont Landfill as of 2009.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, it may close three years earlier, in January 2029.[1372] Under Alternative 5, demolition activities, which generate construction debris, are expected to conclude in 2024 at Candlestick Point and in 2021 at HPS Phase II, a minimum of five years before the landfill is expected to close. Further, the City requires the diversion of at least 65 percent of construction waste, as also required by mitigation measure MM UT-5a, which would reduce the amount of waste interred at the landfill. Further, the City continues to actively explore various waste-reduction strategies with the goal of moving towards zero waste. If the City achieves this goal, the impact of construction of the Alternative 5 on solid waste would be further

[1372] CIWMB, 2009.

reduced. The impact of the construction waste generated by the Alternative 5 on the capacity of the Altamont Landfill would be less than significant.

Construction activities, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. The amount of these materials would be that could be disturbed would be less than the Project because the Yosemite Slough Bridge would not be constructed. Hazardous waste would require disposal by a licensed transporter to a TSD authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently during the construction period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes (refer to Setting). Depending on a number of factors, some soil would be transported off site for disposal and some soil may be transported to other areas of the site. Contaminated soils may require transportation off site and treatment at authorized TSDs. Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, construction of Alternative 5 would not generate hazardous wastes (construction debris or contaminated soil) that would exceed the capacity of TSDs authorized to treat such waste. This would be a less-than-significant impact.

At full build-out, the Alternative would generate approximately 19,487.8 tons annually when all uses are fully operational and assuming no waste-reduction measures. The amount of solid waste generated under Alternative 5 would be 2,339.2 tons less than the Project because the stadium would not be constructed. Solid waste generated under Alternative 5 would represent approximately 3.3 percent (compared to 3.7 percent under the Project) of the total waste generated in San Francisco as of 2008 (approximately 594,732 tons). All residents and businesses of Alternative 5 would be required to comply with the City's mandatory recycling and composting ordinance. In addition, consistent with the City's goal of achieving zero waste by the year 2020, the Project Applicant would prepare a Site Waste Management Plan as required by the identified mitigation measure (MM UT-7a.1) that would specify the methods by which the Alternative 5 would divert operational solid waste to assist the City in achieving its diversion goals. The impact of operational solid waste generated by Alternative 5 on the capacity of the Altamont Landfill (and/or the landfill with which the City contracts at the close of the current selection process) would be less than significant.

Nearly all uses under Alternative 5 would involve the routine use of hazardous materials at varying levels that would require disposal. The amount of hazardous materials would be reduced because the stadium would not be constructed. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this time. Therefore, it is assumed that a variety of hazardous materials could be used in small quantities, ranging from R&D in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios, and the marina, where small quantities of fuel could be utilized. The amounts of hazardous waste that would be generated by such uses would not be substantial. In addition, new residents and businesses would be expected to comply with all hazardous waste regulations, including the disposal of household hazardous waste. Because the minimal amount of hazardous waste that would be generated by the Alternative 5 could be accommodated by existing TSD facilities, this impact would be less than significant.

Electricity, Natural Gas, and Telecommunications

The proposed utility infrastructure improvements for Alternative 5 would include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications, the same as for the Project. This alternative would not include the new stadium, CPSRA improvements, or the Yosemite Slough bridge. As the development would be smaller than the Project, less electricity, natural gas, and telecommunications serves would be required. Infrastructure expansion would not be as extensive as required for the Project. However, these differences between Alternative 5 and the Project would not substantially affect the infrastructure plan as presented for the Project and, therefore, impacts would be the same as for the Project, and less than significant.

Energy

Construction activities associated with implementation of Alternative 5 would require energy sources including electricity, diesel, and gasoline. Similar to the Project, the construction activities for Alternative 5 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not generate a prolonged demand for energy and would be subject to requirements to minimize wasteful fuel consumption. Energy use during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge and stadium would not occur. Furthermore, given the type of development proposed under this Alternative, the energy demand created during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related energy use associated with development under Alternative 5 would be considered less than significant.

Implementation of Alternative 5 would result in baseline electricity consumption similar to the Project and would include the energy savings associated with the Project Applicant's commitment to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project, those efficiency measures would result in consumption of at least 5.4 percent less electricity than a project that would not implement such measures. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential electricity use impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, and MM GC-4, which would require installation of energy efficient lighting, would reduce electricity consumption impacts of Alternative 5 to less than significant. In addition, the San Francisco 49ers stadium would not be constructed at HPS Phase II resulting in reduced electricity demand compared to the Project.

Implementation of Alternative 5 would result in baseline natural gas consumption similar to the Project and would include efficiency measures similar to the Project resulting in the use of approximately 13 percent less natural gas than a development project without such measures. Those efficiency measures would result in consumption of at least 13 percent less natural gas than a development project without

such measures. In addition, the Project Applicant will also implement renewable energy strategies, such as the use of photovoltaic cells to provide electricity, the use of solar thermal energy to provide space cooling with the use of absorption systems, and/or water for space heating and domestic water systems. However, because the Project Applicant's commitment to implement energy reductions and voluntary green building practices (beyond the measures required in the City's Green Building Ordinance) is preliminary and not based on actual building designs, mitigation is necessary to reduce potential natural gas consumption impacts to a less-than-significant level. Mitigation measure MM GC-2, which requires the Project Applicant to exceed the 2008 Title 24 energy efficiency standards for homes and businesses by at least 15 percent, and mitigation measure MM GC-3, which would require installation of ENERGY STAR appliances for builder-supplied appliances, would reduce natural gas consumption impacts of Alternative 5 to less than significant. In addition, the San Francisco 49ers stadium would not be constructed at HPS Phase II resulting in reduced natural gas demand compared to the Project.

Alternative 5 would increase trips to and from the Project site, increasing the use of petroleum fuels. Based on average fuel efficiencies for the City of San Francisco and a VMT similar to that of the Project, this Alternative would result in a demand for 14.01 million gallons of gasoline and 0.93 million gallons of diesel annually. Similar to the Project, fuel consumption resulting from travel to and from the Project site would be five times as high as under existing conditions, indicating a large increase in consumption. However, this consumption would not be wasteful because (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. Without the San Francisco 49ers stadium at HPS Phase II, game day and event-related fuel consumption would be avoided. Therefore, similar to the Project, Alternative 5 would not be wasteful with respect to petroleum fuel consumption, and impacts are considered less than significant.

Greenhouse Gas Emissions

Similar to the Project, construction activities associated with implementation of Alternative 5 would emit GHGs associated with diesel and gasoline consumption. Similar to the Project, the construction activities for Alternative 5 would not include unusual or atypical activities that would result in a higher-than-average demand for fuels. Construction would consist of temporary activities that would not be a prolonged source of GHG emissions. GHG emissions during the construction period would be similar to the Project but slightly reduced because construction of the Yosemite Slough bridge and stadium would not occur. Furthermore, given the type of development proposed under this Alternative, the GHG emissions during the construction period would not be large in comparison to a project of a similar size and with similar land uses. Therefore, construction-related GHG emissions and climate change impacts associated with development under Alternative 5 would be considered less than significant.

Implementation of Alternative 5 would result in baseline GHG emissions similar to the Variant 2 and would include the GHG emissions savings associated with mitigation measures including MM GC-1

through MM GC-4 which requires the implementation of the Project Applicant's conceptual commitments to (1) reduce energy use to 15 percent below Title 24 2008 standards for all development components, and (2) use ENERGY STAR appliances for all appliances installed by builders in residential units. This Alternative would also be required to comply with the City's Green Building Ordinance, per Chapter 13C of the *Environment Code*. Similar to the Project and Variant 2, Alternative 5 would increase trips to and from the Project site, increasing the use of petroleum fuels. However, this Alternative would also include the Project Applicant's commitment to reduce transportation related GHG emissions: (1) this Alternative would include measures to minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; (2) this Alternative would include a TDM program designed to reduce the remaining vehicle trips; and (3) this Alternative would result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. The programs included in this Alternative for minimization of trips, as well as the density, mix of uses, and overall physical layout, would result in efficiency in the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. Without the San Francisco 49ers stadium at HPS Phase II, game day and event-related GHG emissions would be avoided. Thus, GHG emissions at the Project site under development of Alternative 5 would not inhibit the achievement of the goals of AB 32 or the SFCAP. Similar to the Project and Variant 2, GHG emissions and climate change impacts would be less than significant.

BAAQMD is considering the future adoption of quantitative CEQA thresholds of significance for operational-related GHG emission impacts. At present, two options relevant to the Project are under consideration for operational GHG emission thresholds; the lead agency can choose either option. Option 1 is based on a project's total operational GHG emissions of 1,100 metric tonnes CO_2e per year. The Project's total operational emissions would exceed this level, which means that if this was used, the Project would be significant. Option 2 is based on the amount of a project's operational GHG emissions per service population, set at 4.6 metric tonnes CO_2e per year. In anticipation of proposed new BAAQMD CEQA thresholds of significance for GHG emissions, this EIR provides an analysis of the Project's operational GHG emissions under the proposed thresholds of significance identified above. The BAAQMD thresholds stated above are still in draft form and may undergo additional changes before being finalized; a revised version is expected Monday, November 2nd. The methodologies presented in this EIR for quantification of GHG operational emissions is based on using more refined data sources than indicated in the BAAQMD guidance and are the most appropriate to use for Alternative 5 and the Project.

With mitigation, the Project-related operational emissions of 154,639 result in 4.5 tonnes CO_2e per service population per year based on a service population of 34,242 (this accounts for 23,869 net new residents and all jobs except for the stadium jobs, which already exist, 10,373). Therefore, the Project-related operational emissions would be less than 4.6 tonnes CO_2e per service population per year and would result in a less-than-significant impact on climate change. Alternative 5 would reduce total development compared to the Project. Alternative 5 would decrease the housing density and alter the service population which would impact the amount of GHG emissions per service population. Without a quantitative analysis, the comparison to the BAAQMD threshold cannot be judged, and Alternative 5 may not be below the proposed threshold.

Attainment of Project Objectives

Alternative 5 would meet most of the Project objectives, although it would meet transportation-related objectives to a lesser extent than the Project because this Alternative does not include the Yosemite Slough bridge. Refer to Table VI-10 (Attainment of Project Objectives Alternative 5) below for a discussion of each objective.

Table VI-10 Attainment of Project Objectives Alternative 5

Objective	*Meets Project Objective?*	*Analysis*
1. The integrated development should produce tangible community benefits for the Bayview and the City.	Y-	Alternative 5 would include the same development program and uses as the Project, resulting in the same range of job and economic development opportunities. This alternative would renovate and replace the artist studios at HPS Phase II and create a permanent space for artists. However, it would include substantially less parks and open space amenities compared to the Project because no State Parks agreement would occur and no improvements would be made to the CPSRA. Alternative 4 would not meet this objective to the same extent as the Project.
2. The integrated development should re-connect Candlestick Point and the Hunters Point Shipyard site with the larger Bayview neighborhood and should maintain the character of the Bayview for its existing residents.	Y-	Alternative 5 would include the same development program and uses as the Project. The proposed mix of uses and urban design concepts would provide a direct physical, visual, and architectural connection to the Bayview neighborhood and City. This alternative also includes extension of the transportation network into the Project site. Those connections would allow residents of the Bayview neighborhood and City to access the commercial, cultural, and institutional opportunities at the Project site. However, this alternative would not include the Yosemite Slough bridge. Therefore, while Alternative 5 would meet this Project objective, it would not meet it to as great an extent as the Project.
3. The integrated development should include substantial new housing in a mix of rental and for-sale units, both affordable and market-rate, and encourages the rebuilding of Alice Griffith Housing.	Y	Alternative 5 would include a variety of unit types, sizes, and structures, and a wide range of affordability levels. This alternative would also include the redevelopment of the Alice Griffith Public Housing site. Therefore, Alternative 2 would meet this Project objective.
4. The integrated development should incorporate environmental sustainability concepts and practices.	Y	Alternative 5 would include the same sustainability principles and concepts as the Project. Therefore, Alternative 5 would meet this Project objective.
5. The integrated development should encourage the 49ers—an important source of civic pride—to remain in San Francisco by providing a world-class site for a new waterfront stadium and necessary infrastructure.	N	Alternative 5 would not include construction of a new stadium and would not meet this Project objective.
6. The integrated development should be fiscally prudent, with or without a new stadium.	Y	Development of Alternative 5 would increase sales tax revenue to the City to a similar extent compared to the Project and include a development program that would encourage substantial private capital investment. Alternative 2 would meet this Project objective.

Y = Alternative does meet Project objective.
Y- = Alternative meets Project objective, but to a lesser extent than the Project.
Y– = Alternative meets Project objective, but to a significantly lesser extent than the Project.
N = Alternative does not meet Project objective.

VI.D ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The City's primary objective for the Project is to revitalize the BVHP community by providing the following: increased business and employment opportunities; housing options at a range of affordability levels; improved public recreation and open space amenities; an integrated transportation, transit, and infrastructure plan; and other economic and public benefits, all of which would collectively have no net negative impact on the City's General Fund.

Alternative 1 (No Project) would reduce Project impacts because development would only occur at HPS Phase II, resulting in reduced construction-related impacts and fewer or less substantial operational impacts due to the reduced population and employment growth. Alternative 2 (CP-HPS Phase II Development Project, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge) would avoid Project impacts related to biological resources, water quality, and hazardous materials because the Yosemite Slough bridge would not be constructed. However, because the Yosemite Slough bridge would not be constructed, Alternative 2 would result in increased traffic-related impacts on game days. Alternative 3 (Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians) would reduce Project impacts because development would primarily occur at HPS Phase II, resulting in reduced construction-related impacts and fewer or less substantial operational impacts due to the reduced population and employment growth. Stadium-related impacts including light and glare, traffic, air quality, and noise would be avoided because the stadium would not be constructed. Alternative 4 (Reduced CP-HPS Phase II Development, Historic Preservation, No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge) would reduce the most significant Project impacts to a less-than-significant level (reduced traffic-related air quality and noise impacts, avoidance of historic resource impacts, and avoidance of construction-related impacts to water quality and biological resources because the bridge and marina would not be constructed). Subalternative 4A (CP-HPS Phase II Development Plan with Historic Preservation) would avoid the significant Project impacts to historic resources, but all other impacts would be the same as for the Project. Alternative 5 (Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge) would avoid Project impacts related to biological resources, water quality, and hazardous materials because the Yosemite Slough bridge would not be constructed. However, because the Yosemite Slough bridge would not be constructed, Alternative 5 would result in increased traffic-related impacts resulting from population and employment growth at HPS Phase II. Alternative 4 would be the environmentally superior alternative. However, this Alternative would not meet the objectives to the same extent as the Project.

VI.D.1 Alternatives Considered But Eliminated from Further Analysis in the EIR

A number of alternatives were proposed during the planning and public scoping process for the project. Several of these alternatives were identified by Arc Ecology, a local community organization. In January 2009, Arc Ecology published a report titled *Alternatives for Study, Draft Outline of Issues, Positions, and Alternatives for Public Comment and Further Study* (Arc Ecology Report).[1373]

[1373] Arc Ecology, Draft Alternatives for Study, Draft Outline of Issues, Positions, and Alternatives for Public Comment and Further Study, January 2009.

Alternatives considered, but eliminated from further analysis in the EIR, were evaluated in concept, but were eliminated for one or more factors, including (1) they did not reduce significant environmental effects; (2) they did not achieve most of the basic Project objectives; and/or (3) they were not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. As stated above, according to CEQA Guidelines Section 15126.6(f)(1), factors that may be considered when a Lead Agency is assessing the feasibility of an alternative include:

> [S]ite suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or the site is already owned by the proponent) (CEQA Guidelines, Section 15126.6(f)(1)).

The alternatives considered but eliminated from further analysis in this EIR include:

- Alternative San Francisco 49ers stadium locations (City of Brisbane or Port of San Francisco sites)
- Alternative land use plans and locations for the 49ers Stadium on HPS Phase II
- Alternative land use plan for Candlestick Point
- Develop Candlestick Point for parks and open space only
- Alternative locations for the Project within the City of San Francisco
- Alternative locations for the Project outside the City of San Francisco

Alternative San Francisco 49ers Stadium Locations

Alternative sites for the 49ers Stadium identified through the process explained above include:

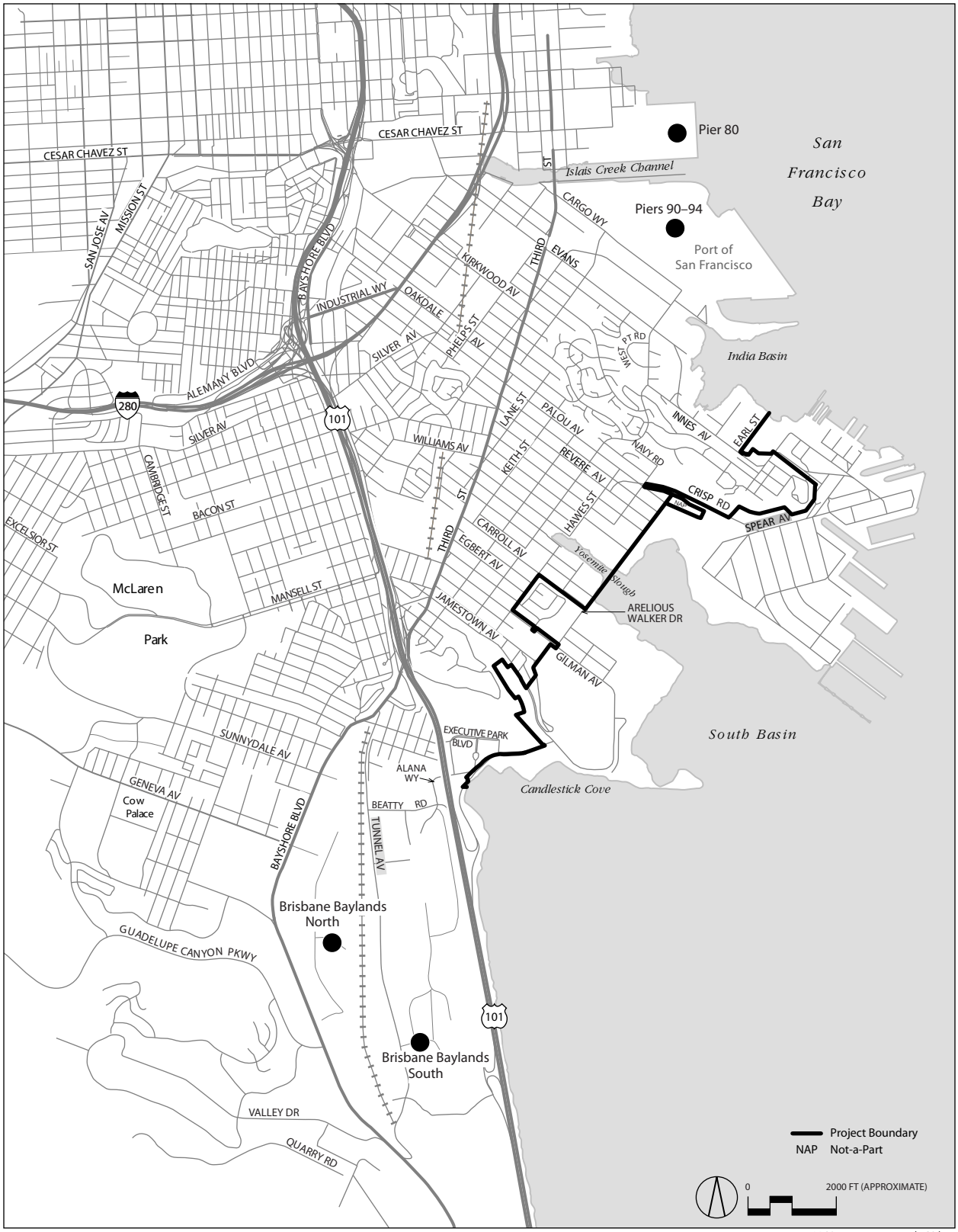
- City of Brisbane
  - > Brisbane Baylands South
  - > Brisbane Baylands North
- Port of San Francisco
  - > Pier 80
  - > Piers 90 to 94 Backlands

All of these sites were evaluated but determined to be infeasible locations for the reasons explained below.

Figure VI-5 (Alternative Off-Site Stadium Locations) illustrates the off-site stadium locations.

City of Brisbane Sites

The City of Brisbane in San Mateo County is completing a planning process for the area known as the Brisbane Baylands, an approximately 659-acre area generally west of US-101, east of the Union Pacific/Caltrain railroad right-of-way, and south of the San Francisco/San Mateo County line.



SOURCE: PBS&J, 2009.

PBS&J 10.31.09 08068 | JCS | 09

FIGURE VI-5

Candlestick Point — Hunters Point Shipyard Phase II EIR

ALTERNATIVE OFF-SITE STADIUM LOCATIONS

The Brisbane General Plan currently designates the Brisbane Baylands area as Planned Development–Trade Commercial and in the Commercial Mixed-Use zoning district (C-1 Baylands). The Brisbane Baylands Specific Plan framework, which is the planning document addressing concepts for the Brisbane Baylands, provides the basis for the Phase I Specific Plan that addresses the 446-acre eastern portion of the 659-acre Baylands area.[1374] The Baylands site, now owned by Universal Paragon Corporation (UPC) is located on the former Southern Pacific Railroad Yard and former landfill sites. The Phase I Specific Plan proposes approximately 107 acres of commercial, 68 acres of office/institutional, 118 acres of aquatic open space, 99 acres of upland open space/open area, and 54 acres of right-of-way streets and infrastructure for this area. The plan also addresses basic parameters for circulation, land use, open space, infrastructure, and utilities for potential future development of the larger 659-acre area, including the Phase I Specific Plan area and adjacent properties generally situated to the west, between the Caltrain rail line and Bayshore Boulevard. UPC also owns the Schlage Lock site north of the Brisbane Baylands Specific Plan area in San Francisco.[1375] The 2006 Specific Plan is continuing to go through public review, and the City of Brisbane is preparing a Draft Environmental Impact Report for the plan.

The Arc Ecology Report identified two sites within the Brisbane Baylands area for alternative stadium locations because the sites are large and undeveloped, with freeway and transit access. One is within the Brisbane Baylands Phase I Specific Plan area (Brisbane Baylands South). The second site is within the Brisbane Baylands Future Phase area (Brisbane Baylands North). As noted, both of those sites are generally designated for Planned Development–Trade Commercial in the Brisbane General Plan and are located in the Commercial Mixed-Use zoning district (C-1 Baylands). The Brisbane Baylands Phase I Specific Plan designates the Brisbane Baylands South site for office and institutional uses. The Brisbane Baylands Framework Plan designates the Brisbane Baylands North site for commercial, office, and service industrial uses.

The Brisbane Baylands locations are not considered feasible sites for the 49ers stadium for the following reasons:

- The Baylands Specific Plan, although not yet formally adopted, does not include a stadium as an allowed use in either the northern or southern portions of the site. Both sites are designated for commercial, office, institutional, and industrial uses. While planning considerations in a particular jurisdiction can evolve over time, it is expected that the range of uses identified in the Phase I Specific Plan reflect Brisbane's long-term planning goals for the Brisbane Baylands, which plans do not include developing a professional football stadium.
- The Brisbane sites are outside of the City and County of San Francisco. Planning review, and approval of a stadium in Brisbane Baylands would be subject to City of Brisbane jurisdiction. Neither the San Francisco Redevelopment Agency (Agency), the City and County of San Francisco, nor Lennar Urban would reasonably be able to acquire, control, or otherwise have access to a Brisbane site for the purpose of pursuing such alternative locations. Thus, the Brisbane Baylands sites were determined to be infeasible for development of the stadium, and were rejected from further consideration in the EIR.

[1374] City of Brisbane, Initial Study for the Brisbane Baylands Phase I Specific Plan, February 26, 2006.
[1375] The Schlage Lock site is not part of the Brisbane Baylands Specific Plan area. This site is within the Visitacion Valley Redevelopment Project Area and is programmed for mixed-use development, including approximately 1,250 residential units.

Port of San Francisco Sites

The Port of San Francisco (Port) controls approximately 7.5 miles of San Francisco's waterfront, generally extending from Fisherman's Wharf to India Basin. The Port's property consists of former public tidelands, which are held in "Public Trust." The Port oversees a broad range of commercial, maritime, and public activities on the public trust property. The "public trust" is a legal doctrine that governs the use of tide and submerged lands, including former tide and submerged lands that have been filled. Public trust lands are required to be used for public trust purposes, which include navigation, fisheries, waterborne commerce, natural resource protection, and water-related uses that attract the public to use and enjoy the waterfront.[1376] The Waterfront Land Use Plan was initially adopted by the Port in 1997 and defines acceptable uses, policies, and land use information applicable to properties under the Port's jurisdiction.[1377]

The Arc Ecology report identified two sites for alternative stadium locations, including Pier 80 and the backlands of Piers 90 to 94. Arc Ecology recommended the alternative stadium sites on Port property because the sites are large, with freeway and transit access. Development of a stadium at either site would also generate minimal traffic through residential neighborhoods (refer to Figure VI-5). Both sites are part of the Port's Piers 80–96 Maritime Cargo area and are reserved for port and industrial uses.

The Maritime Cargo area is the Port's last remaining Maritime Cargo handling facility and is a critical component to the Port's State-mandated mission of providing and supporting maritime commerce, navigation and fishery uses. The Maritime complex area was identified in the Waterfront Land Use Plan for cargo uses because of the significant investment the State, the Port, and the City have spent on the cargo facilities, supporting infrastructure, and related transportation infrastructure. Included in this investment is the recently completed $27 million multi-modal Illinois Street freight rail bridge, designed to support on-dock freight rail access and to improve the connection between the active cargo piers. Each of the remaining cargo facilities services a unique but inter-related cargo role. Pier 80 is the last remaining Bay Area breakbulk cargo terminal, facilitating the movement of goods such as steel, lumber, machine parts, and other cargos not suitable to be shipped in a container.[1378] Piers 90 to 94 are used to import bulk cargos such as sand and aggregate. Combined, the complex supports nearly all of the construction-related activities in San Francisco, the San Francisco Peninsula, and beyond that rely on steel, concrete, and aggregate supplies for construction of buildings and infrastructure. In addition to the important role the Port facilities play in supporting infrastructure and new development projects, they employ a high number of high-paying production, distribution, and repair (PDR) workers.[1379]

The San Francisco Bay Area Seaport Plan, co-authored by the San Francisco Bay Conservation Development Commission (BCDC) and the Metropolitan Transportation Commission (MTC), designates these facilities for Port Priority Use, and calls for these facilities to be retained to support cargo operations. The Port's Piers 80–96 facilities are some of the last remaining lands available in the City for heavy

[1376] California State Lands Commission, Public Trust Policy. http://www.slc.ca.gov/Policy_Statements/Public_Trust/Public_Trust_Policy.pdf (accessed online July 23, 2009).
[1377] Port of San Francisco, Waterfront Land Use Plan, adopted June 1997 and as amended.
[1378] Break-bulk cargo is a shipping term for any loose material that must be loaded individually, not in shipping containers or in bulk as with oil or grain.
[1379] David Beaupre, Planning and Development, Port of San Francisco, Email correspondence with Wells Lawson, Mayor's Office of Economic and Workforce Development, May 1, 2009.

industrial uses and are largely port-related industrial uses that are water-dependent or relate to or support the adjacent water-dependent uses.

Sports facilities, such as the San Francisco 49ers stadium, are not considered allowable uses at either site under the Waterfront Land Use Plan. Both sites considered are State Tidelands subject to the Public Trust, which restricts the types of allowable uses. Public recreation and assembly uses are consistent with the Public Trust. However, Proposition H, a ballot measure adopted by voters in 1990, imposed criteria for consideration of "non-maritime" uses. Under Proposition H, sports facilities with seating capacity greater than 22,000 seats, such as a new 49ers football stadium, would be subject to approval by voters at a public election.[1380]

The Port locations are not considered feasible sites for the 49ers stadium for the following reasons:

- A stadium would displace maritime-dependent cargo handling and industrial uses not available or feasible elsewhere in San Francisco.
- Sports facilities are not allowable uses at either site under the Waterfront Land Use Plan.
- A stadium use at either site would be subject to approval by voters at a public election.

Thus, the Port sites were determined to be infeasible for development of the stadium and were rejected from further consideration in the EIR.

Alternative Land Use Plans and Locations for the 49ers Stadium at HPS Phase II

Five alternative land use plans were proposed by Arc Ecology and studied in concept for this document. They include proposals to locate the stadium on Parcels B, C, and G of HPS Phase II; one proposal with no stadium at HPS Phase II; and one alternative land use plan for Candlestick Point. All of the Arc Ecology alternative land use plans for HPS Phase II and Candlestick Point are within the same Project site boundaries and assume a development program similar to the Project with the intent of improving economic, social, and environmental benefits compared to the Project. Figure VI-6 (Arc Ecology Alternative Land Use Plans) illustrates the alternative land use plans. The alternatives are based on the following concepts:

- Connect the waterfront to existing neighborhoods and open space areas.
- Transfer State and City parkland to improve overall distribution and quality of open space areas.
- Identify geologic constraints to determine suitable building sites.
- Develop an urban waterfront park with contiguous ecological habitats in conjunction with programmed open space areas.
- Connect existing habitats in the Project site and vicinity.
- Develop neighborhood-serving parks with programmed uses and low-impact design techniques to provide on-site stormwater treatment.
- Create a bicycle and pedestrian network connecting new and existing neighborhoods to park and open space facilities.

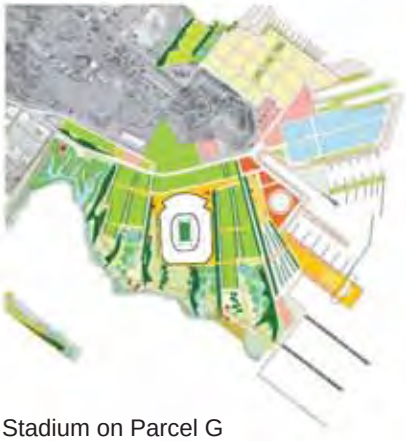
[1380] Port of San Francisco, Waterfront Land Use Plan, adopted June 1997 and as amended.



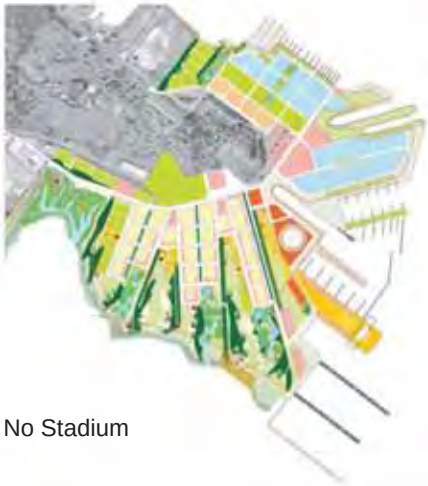
Stadium parcel B



Stadium on Parcel C



Stadium on Parcel G



No Stadium



Candlestick Point



SOURCE: Arc Ecology Alternatives for Study, January 2009.

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Candlestick Point — Hunters Point Shipyard Phase II EIR

ARC ECOLOGY ALTERNATIVE LAND USE PLANS

FIGURE VI-6

To the extent that the Arc Ecology alternatives present a mix of uses and at an intensity similar to the Project, including residential, commercial, research and development (R&D), cultural and entertainment, hotel, sports fields, and open space areas, these alternatives can be expected to have impacts similar to the Project. The alternatives for HPS Phase II also present new uses, including an industrial maritime facility, museum, festival and performance venue, driving range, cultural plaza/sculpture park, and solar arrays on Piers 1 and 2. Generally, these new uses would result in impacts similar to or greater than the Project. All of the Arc Ecology alternatives include an upland roadway connection between Candlestick Point and HPS Phase II and no Yosemite Slough bridge. In this regard, the Arc Ecology alternatives are similar to Alternatives 2, 4, and 5 analyzed above, all of which do not include the Yosemite Slough bridge. All HPS Phase II alternatives would include open space uses along the shoreline of Parcels E and E-2 and the north end of Parcel B, the same as the Project. All of the alternatives would also include a 20,000-seat arena and marinas along the shorelines of Parcels B, C, and D, compared to the 10,000-seat arena on Candlestick proposed as part of the Project, a component of these alternatives that would potential increase, not decrease impacts compared to the Project.

Overall, the Arc Ecology land use alternatives are rejected because they do not reduce or avoid environmental effects of the Project in ways different from the Alternatives examined above. A more detailed explanation is included below for why each of these proposals was rejected from further consideration in this document.

Stadium on Parcel B

This alternative would generally be within the same HPS Phase II site boundaries and follow a development program similar to the Project. Compared to the Project, this Alternative would relocate residential uses from Parcel B to Parcels E and G, and the stadium would be located on Parcel B. R&D uses would be north of Crisp Road and would be reduced at HPS Phase II compared to the Project. Additional R&D uses could be accommodated at Candlestick Point. Stadium parking would be on dual-use fields west of the stadium on Parcel B and to the south on Parcel C. A 20,000-seat arena would be on Parcel D as opposed to the 10,000-seat arena proposed at Candlestick Point under the Project.

The proposal would not reduce any impacts from the project except those associated with constructing and operating the Yosemite Slough bridge, a component of Alternatives 2, 4, and 5. With an assumed development of the same magnitude as the Project, most construction impacts would not be reduced, including, but not necessarily limited to, impacts on archaeological resources, air quality, noise, geology and soils, hydrology and water quality, and biological resources. Construction of this alternative would require the same shoreline improvements as the Project to ensure public safety, resulting in impacts similar to the Project. Impacts to biological resources related to construction of the Yosemite Slough bridge would be avoided because no bridge would be constructed. Construction of a marina along the shoreline of Parcels B, C, and D could result in impacts to aquatic resources and water quality, similar to the Project, but with an additional marina at Parcel B. Buildings 211, 231, and 253 at HPS Phase II, have been determined eligible for the California Register of Historic Resources (CRHR) and are contributors to the Hunters Point Commercial Dry Dock and Naval Shipyard Historic District. Development of the dual-use fields on Parcel C would require demolition of those buildings, similar to the Project.

The proposal to locate residential uses on Parcel Parcels E and G, could result in additional impacts from hazardous materials remediation, since the Navy's remedial program is designed to remediate the property to a level that would allow for uses as set out in the 1997 HPS Redevelopment Plan, which generally calls for non-residential uses on Parcels E and G. Construction of housing on Parcels E and G would require the property owner to go through the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) process to obtain approval from the Regulatory Agencies to use that area for a residential use. Depending on the outcome of the CERCLA process, further remediation and/or property controls could be required, potentially resulting in additional impacts that could result from exposure to hazardous materials during the remediation process as compared to the Project.

Because the development program of this alternative would be the same or similar to the Project, operational impacts would not be reduced, including impacts to land use, population, housing and employment, aesthetics, shadow, wind, air quality, noise, public services, utilities, energy, and secondary land use, with the exception of those operational impacts avoided with the elimination of the Yosemite Slough bridge. Significant traffic, noise, and air quality impacts would not be reduced, including impacts from daily operations and game days. The stadium on HPS Phase II Parcel B with this alternative would result in game day traffic patterns different from those that would occur with the Project. Section III.D identified routes subject to additional congestion during post-game conditions with the Project. (Refer to Table III.D-23 [Locations of Congestion Following San Francisco 49ers Football Game].) With this alternative, the primary transportation route to the stadium would be from Third Street, via Cargo Way, Evans Avenue, and Innes Avenue, with lesser volumes on the Harney Way, Gilman Avenue, or Paul Avenue corridors compared to the Project. This alternative could therefore result in additional game-day traffic impacts on those corridors, exacerbating vehicle congestion during post-game conditions compared to the Project. In addition, with no Yosemite Slough bridge, this alternative would result in greater transportation-related impacts on game days because vehicular traffic to and from the stadium would be delayed, and traffic levels would be further increased on local streets, including Innes Avenue, Evans Avenue, and Ingalls Street.

Operation of a 20,000-seat arena on HPS Phase II Parcel D could increase traffic-related impacts from arena events because the arena capacity would be doubled compared to the Project. Also, the arena on the HPS Phase II site instead of at Candlestick Point could increase arena-related traffic impacts at intersections along the Innes Avenue, Evans Avenue, and Cargo Way corridors to Third Street, compared to the Project.

The Stadium on Parcel B Alternative would reduce biological impacts of the Project that are associated with the Yosemite Slough bridge but in other respects this proposal has the same or greater impacts as compared to the Project. Alternatives that do not include the Yosemite Slough bridge are included above. This alternative is rejected as either similar to alternatives examined or similar to the project and, therefore, offering no environmental benefits not considered in the Alternatives analysis.

Stadium on Parcel C

This alternative is generally the same as the Stadium on Parcel B, except the stadium would be located on Parcel C and parking for the stadium would be located on Parcel B. This proposal would have the same impacts as the Stadium on Parcel B proposal and is rejected for the same reasons as explained above for Stadium on Parcel B.

Stadium on Parcel G

This alternative would generally be within the same HPS Phase II site boundaries and follow a development program similar to the Project. This alternative is also similar to Alternative 2 (CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge). Compared to the Project and Alternative 2, the Arc Ecology stadium on Parcel G Alternative the stadium would be moved west to Parcels E and G and a 20,000-seat arena would be east of the stadium on Parcel D. Stadium parking would be on dual-use fields surrounding the stadium. Residential uses would be on Parcel B and R&D uses on Parcel C. This proposal does not reduce or avoid environmental impacts in a substantially different way than Alternative 2 and for this reason is rejected from further consideration. CEQA does not require analysis of every alternative, just a reasonable range of alternatives and an alternative similar to this proposal is examined in detail above.

No Stadium at HPS Phase II

This alternative would generally be within the same HPS Phase II site boundaries and follow a development program similar to the Housing Variant. The Arc Ecology No Stadium Alternative would include a mix of residential, commercial, R&D, cultural, and open space uses. Residential uses would be on Parcels D, E, and G, with commercial uses distributed throughout the site. R&D uses would be on Parcels B and C and an educational campus would be located on Parcel C, which is different from the Project and Housing Variant. A 20,000-seat arena would be east of the stadium on Parcel D.

This proposal is similar to Alternatives 1, 3, and 5 that consider no stadium at HPS Phase II. The Housing Variant and R&D Variant also address the no stadium scenario.

With an assumed development of the same magnitude as the Housing Variant, this proposal would have similar construction and operational impacts. Impacts to biological resources related to construction of the Yosemite Slough bridge would be avoided because no bridge would be constructed, but Alternative 2, 4 and 5 also proposed alternatives without the Yosemite Slough bridge.

Operation of the 20,000-seat arena on Parcel D could increase traffic-related impacts from arena events as described above, which would not result in reduced or avoided impact, the goal in selecting CEQA alternatives.

This alternative was rejected because it is essentially duplicative of several development programs analyzed in this EIR and would not result in reduced or avoided impacts not already identified in alternatives considered above.

Alternative Land Use Plan for Candlestick Point

This alternative would generally be within the same Candlestick Point site boundaries and follow a development program similar to the Project. The Arc Ecology Candlestick Point Alternative land use plan would include a mix of residential, commercial, R&D, cultural, and open space uses.

A main concept of this Arc Ecology alternative is to connect existing open space areas at Candlestick Point to the CPSRA. Wildlife and vegetation corridors would connect the shoreline to inland open space areas. Section III.N identifies that there is localized movement between Bayview Hill and the CPSRA. However,

it is concluded that the Project would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors.

With an assumed development of the same magnitude as the Project, construction and operational impacts are generally similar. As this alternative is not substantially different from a Project Variant, it was rejected from further consideration in this EIR.

Individual Alternative Land Uses at Candlestick Point and HPS Phase II

The Arc Ecology report identified additional alternative land uses and concepts for development at Candlestick Point, HPS Phase II, and improvements to areas outside of the Project site. Table VI-11 (Summary of Arc Ecology Land Uses and Concepts for Candlestick Point and HPS Phase II) outlines those concepts and includes a comparison to Project features and impacts. To the extent that these are duplicative of Project or Alternative components, impacts associated with these concepts are analyzed in Chapter III or this Chapter VI. Reasons for rejecting other concepts are explained below.

Table VI-11 Summary of Arc Ecology Land Uses and Concepts for Candlestick Point and HPS Phase II

Arc Ecology Alternative Proposal (Page #)[a]	*Relationship to Project Impacts*
Locate PDR businesses at Candlestick Point (117)	Arc Ecology proposes PDR uses at Candlestick Point near existing and new residential uses as a potential relocation area for PDR uses displaced by the Arc Ecology proposal to day light Yosemite Creek. The Project does not propose PDR uses, nor does it propose displacement of existing PDR uses. PDR uses at Candlestick Point could result in different and/or additional traffic-related impacts. Operational noise and air quality impacts could also occur, including impacts to sensitive receptors due to the proximity of existing and proposed residential uses. Therefore, locating PDR uses at Candlestick Point would not reduce impacts compared to the Project.
Locate outlets and regional retail at Candlestick Point (117)	Regional retail is proposed at Candlestick Point under the Project. Addition of outlet retail at Candlestick Point would not reduce impacts compared to the Project. The Arc Ecology proposed location of retail would make the uses more visible from northbound US-101. However, this alternative location would not reduce construction or operational impacts of such uses compared to the Project.
Move arena to HPS from Candlestick Point (80, 82, 84, and 86) Expand arena from 10,000 to 20,000 seats (38)	Operation of the 20,000-seat arena on Parcel D could increase traffic-related impacts from arena events because the capacity would be doubled compared to that proposed under the Project and the location would result in generation of additional trips to HPS Phase II. This could increase traffic-related impacts at intersections along the Third Street corridor, compared to the Project.
Shared parking on HPS (throughout plans)	Shared parking at HPS Phase II is proposed under the Project, including dual-use sports fields. Implementation of shared parking at HPS Phase II would not reduce construction or operational impacts compared to the Project.
Maritime industrial uses at HPS (106–107, 114)	Maritime industrial uses are not proposed under the Project. Construction and operation of such uses at HPS Phase II could result in new impacts including, but not necessarily limited to, impacts on air quality, noise, hydrology and water quality, and biological resources.
Indoor sports facility at HPS (80, 103, 111–116)	An indoor sports facility is not specifically proposed under the Project. Construction and operation of an indoor sports facility at HPS Phase II would not reduce impacts compared to the Project. However, such uses are not precluded by the Project.
Move multi-plex cinema to HPS from Candlestick Point (105)	The Project would include a theater at Candlestick Point. Relocating the theater to HPS Phase II would not reduce impacts compared to the Project.

Table VI-11 Summary of Arc Ecology Land Uses and Concepts for Candlestick Point and HPS Phase II

Arc Ecology Alternative Proposal (Page #)[a]	*Relationship to Project Impacts*
Move sports fields closer to neighborhood residences (120)	The Project proposes sports fields at HPS Phase II, primarily surrounding the stadium on dual-use fields. Locating the sports fields closer to residential uses at Candlestick Point or HPS Phase II would not reduce impacts compared to the Project. In addition, locating sports fields in close proximity to residential uses could result in land use conflicts related to noise and nighttime lighting.
Open space link from Third Street to the Bay along Yosemite Slough (122–129) Daylight Yosemite Slough (124–129)	Providing an open space connection from Third Street to the Bay along Yosemite Slough and day lighting of Yosemite Slough west of its current terminus is outside of the Project site. Implementation of such improvements would not reduce impacts of the Project. Instead it would expand the scope of the Project and could result in additional environmental impacts.
Widen waterfront habitat corridors (41) Create habitat corridors to inland open space (41,48,59,64) Reorient Alice Griffith Park to connect with slough (96–99)	Wildlife and vegetation corridors would connect the shoreline to inland open space areas. Section III.N (Biological Resources) identifies that there is localized movement between Bayview Hill and the CPSRA. However, the Project would not interfere substantially with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors. Therefore, widening and reorientation of vertical development would not reduce impacts to wildlife movement compared to the Project.
Provide concession stands in park (throughout plans)	This concept locates park concession stands and other attractions throughout the parks and open space facilities. Construction and operation of such uses would not reduce impacts compared to the Project. However, such uses are not precluded by the Project.
Transfer City land to State Parks (59)	Transfer of City land to State Parks is a policy decision and would not reduce any environmental impacts compared to the Project. An alternative analysis is provided below that evaluates development of only parks and open space at Candlestick Point.
CPSRA nature interpretive center (40)	This use is not precluded by the Project but also does not appear to address any specific environmental impact of the Project. State Parks is undertaking a separate planning process for its park, which will be the vehicle for determining the details of park design.
Alternative Routes to bridge over slough (130)	Alternatives 2, 3, and 4 in this EIR analyze upland transportation routes with no bridge crossing Yosemite Slough.
Alternative urban forms and development layout (60) Extend existing street grid (60) Radial geometry from existing topographic features, land marks and constructed shoreline (60)	The Project does include some of these urban design concepts, such as extending the existing street grid into Candlestick Point. The proposed urban design concepts would not reduce impacts compared to the Project.
Water management: constructed treatment wetlands, storm water retention and irrigation storage ponds (47, 50, 124) Integrated resource conservation with open space systems (50)	The Project incorporates various forms of stormwater management, including vegetated swales, flow-through planter boxes, permeable pavement, green rooftops, and rainwater cisterns. Bioretention basins would also be constructed within parks and open space. The Project would provide a network of reclaimed water mains for dual plumbing in commercial buildings and for irrigation of landscaped areas. Much of these design elements would be incorporated into open space areas. Incorporating additional conservation measure beyond what is already proposed would not further reduce impacts compared to the Project.
Solar arrays on Piers 1 and 2 (38, 80)	Installation of solar arrays on piers is not proposed under the Project. The feasibility of such installations is unknown. New impacts to biological resource impacts could occur, including impacts to waterbirds that roost in large numbers on piers on HPS Phase II. However, installation of solar arrays could reduce energy impacts by providing more local electricity generation.

Table VI-11 Summary of Arc Ecology Land Uses and Concepts for Candlestick Point and HPS Phase II

Arc Ecology Alternative Proposal (Page #)[a]	*Relationship to Project Impacts*
Remove the capped landfill on parcel E2 and replace it with a constructed treatment wetland (32)	Cleanup of Parcel E-2 is not a part of the Project. Cleanup of Parcel E-2 is the Navy's responsibility, as governed by the HPS status as a Superfund site under CERCLA. Moreover, the Project does not propose the transfer of Parcel E-2 until the CERCLA regulatory oversight agencies determine that this parcel is safe for the planned uses. Removing the landfill would not reduce any environmental impacts of the Project.

SOURCE: PBS&J and Arc Ecology, *Draft Alternatives for Study, Draft Outline of Issues, Positions, and Alternatives for Public Comment and Further Study*, January 2009.

a. Page number of Arc Ecology *Draft Alternatives for Study*, January 2009.

Develop Candlestick Point for Parks and Open Space Only

Under this alternative, the majority of Candlestick Point would be developed as a park and open space, assuming the San Francisco 49ers stadium is constructed at HPS Phase II or elsewhere. The entire CPSRA would remain under the jurisdiction of the California Department of Parks and Recreation (CDPR). Candlestick Park and the surrounding area would remain in the Public (P) zoning district, which permits public uses and facilities. This alternative would reduce construction-related impacts of the Project, as less development would occur on the Candlestick Point site. It would reduce or avoid many of the operational Project impacts. However, this alternative would meet few, if any, of the Project objectives, including creation of a range of job and economic development opportunities. In addition, this alternative would most likely have to be funded and developed by the City. Finally, the feasibility of phasing land development at Alice Griffith to allow residents to move directly into new homes would be compromised under this scenario.

Alternative Locations for the Project outside the City of San Francisco

This alternative would involve development of the Project on a site outside of the City. If feasible, development of the Project at another location could reduce site-specific impacts to biological resources (e.g., no bridge-related construction impacts) and cultural resources (e.g., demolition of historic resources at HPS Phase II); however, it would not reduce or avoid Project impacts associated with construction (e.g., air quality and noise) or operation (e.g., traffic, air quality, and noise). In fact, this alternative, while it would remove significant impacts from vehicular traffic on City streets in the Project area, it would shift these impacts to other jurisdictions. Although this alternative would reduce potentially adverse site-specific impacts that could conceivably be avoided at other sites, if site of this size could be found available, development at a location outside the City would fail to meet any of the Project objectives. Developing the Project outside the City would not provide benefit to the citizens of the Bayview neighborhood or San Francisco.

Alternative Locations for the Project within the City of San Francisco

This alternative would involve development of the Project on a site outside of the Bayview Neighborhood, but still within the City; however, there are no vacant parcels or designated redevelopment areas large enough (at least 702 acres) to accommodate the Project. Development of the Project at another location would not reduce or avoid the significant impacts associated with construction of the Project (e.g., air and noise), or the operational impacts of the Project (e.g., traffic, air quality, and noise).

VI.E COMPARISON OF ALTERNATIVES

Table VI-12 (Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives) identifies the significant and unavoidable impacts of the Project and identifies whether any of the alternatives lessens or avoids those impacts. The table identifies whether the alternatives result in the same (=), lesser (<), or greater (>) impacts as compared to the Project. The table also provides the level of significance for the Project and the Alternatives after the implementation of all feasible mitigation measures.

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
Impact TR-1 The Project would result in construction-related transportation impacts in the Project vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Project vicinity. Mitigation measure MM TR-1 would reduce but not avoid construction-related transportation impacts during construction activities. Therefore, construction transportation impacts would remain significant.					
Significance of Alternative Compared to Project	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-2 Implementation of the Project would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts. Although implementation of a Travel Demand Management Plan was assumed in developing Project travel demand estimates, and would be essential to ensure that impacts at additional locations do not occur, traffic congestion caused by the Project and the Project's contribution to cumulative impacts would still be significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-3 The Project would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Project vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-4 At the intersection of Tunnel/Blanken, the Project would result in significant Project AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Project	=	=	<	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact TR-5 Project contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Project conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-6 Project contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-8 Project contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-10 The Project would result in significant Project traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Project	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-11 The Project would contribute to significant cumulative traffic impacts at four freeway segments. No feasible mitigation is available.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-12 The Project would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact TR-13 The Project would contribute to significant cumulative traffic impacts at 12 freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-14 The Project would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-15 The Project would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-21 The Project would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Project impacts and Project contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-22 The Project would increase congestion and contribute to cumulative conditions at intersections along Palou Avenue, which would increase travel times and impact operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Implementation of mitigation measure MM TR-22.1 and MM TR-22.2 would reduce impacts to transit operations. However, since feasibility of MM TR-22.1 is uncertain, and since MM TR-22.2, without MM TR-22A, would reduce, but not completely avoid, impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy, Project impacts and Project contributions to cumulative impacts on the these lines would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact TR-23 The Project would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Project impacts and Project contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-24 The Project would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Project impacts and Project contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-25 The Project would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-26 The Project would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Project impacts and Project contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-27 The Project would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Project impacts and Project contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge All*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact TR-28 The Project would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Project would also contribute to cumulative impacts on these transit routes on US-101. No feasible mitigation has been identified.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-30 The Project would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities. No feasible mitigation has been identified.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-32 The Project's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Project	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
Impact TR-38 For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Project	<	=	<	<	<
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Impact TR-39 The existing game day service and Project transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Project	<	=	<	<	<
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Impact TR-46 Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Project	<	=	<	<	<
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact TR-47 The existing transit service and Project improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Project	<	=	<	<	<
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Impact TR-51 Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Project conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Project	<	=	<	<	=
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Impact TR-52 Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations. Implementation of mitigation measure MM TR-23.1 would reduce impacts to less than significant. Due to the uncertainty of this mitigation the impact would remain significant.					
Significance of Alternative Compared to Project	<	=	<	<	=
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
AIR QUALITY					
Impact AQ-4 Operation of the Project would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out in the year 2029.					
Significance of Alternative Compared to Project	<	=	<	<	=
Level of Significance after Mitigation (Project/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Impact NO-2 Construction activities associated with the Project would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before Project construction activity on adjacent parcels is complete. Although the Project's construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Project	=	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-12 Comparison of the Significant and Unavoidable Impacts of the Project to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Impact NO-3 Construction activities associated with the Project would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Project	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Impact NO-6 Operation of the Project would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Project	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Impact NO-7 Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Project	<	=	<	<	<
Level of Significance after Mitigation (Project/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
CULTURAL RESOURCES					
Impact CP-1 Construction activities associated with the Project could result in a substantial adverse change in the significance of a historical resource.					
Significance of Alternative Compared to Project	=	=	=	<	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/LTS	SU/SU

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Because this EIR includes variants to the Project, any one of which could be approved instead of or in combination with the Project, Table VI-13 (Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives) through Table VI-17 (Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Shared Stadium Variant) identify the significant and unavoidable impacts of the variants and identify whether any of the alternatives lessens or

avoids those impacts. The tables identify whether the alternatives result in the same (=), lesser (<), or greater (>) impacts as compared to the variants. The table also provides the level of significance for the Project and the variants after the implementation of all feasible mitigation measures.

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The R&D Variant would result in construction-related transportation impacts in the R&D Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the R&D Variant vicinity.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the R&D Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the R&D Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
At the intersection of Tunnel/Blanken, the R&D Variant would result in significant Project AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
R&D Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Project conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	<	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The R&D Variant's contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
R&D Variant contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would result in significant traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would contribute to significant traffic impacts on freeway conditions.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would contribute to significant cumulative traffic impacts at freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The R&D Variant would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Project impacts and Project contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion and contribute to cumulative conditions at intersections, which would increase travel times and impact transit operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Feasibility of mitigation measures is unclear or would not completely avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Project impacts and Project contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, R&D Variant impacts and R&D Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The R&D Variant would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Project impacts and Project contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Project impacts and Project contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Project would also contribute to cumulative impacts on these transit routes on US-101.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The R&D Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
The existing game day service and transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
The existing transit service and R&D Variant improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under R&D Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under R&D Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
AIR QUALITY					
Operation of the R&D Variant would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Construction activities associated with the R&D Variant would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before Project construction activity on adjacent parcels is complete. Although the R&D Variant's construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Construction activities associated with the R&D Variant would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Operation of the R&D Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
CULTURAL RESOURCES					
The R&D Variant would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

Table VI-13 Comparison of the Significant and Unavoidable Impacts of Variant 1: No Stadium, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The Housing Variant would result in construction-related transportation impacts in the Housing Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Housing Variant vicinity.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the Housing Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Housing Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
At the intersection of Tunnel/Blanken, the Housing Variant would result in significant Project AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Housing Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Project conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant's contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Housing Variant contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would result in significant traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would contribute to significant traffic impacts on freeway conditions.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing Variant would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would contribute to significant cumulative traffic impacts at freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Project impacts and Project contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion and contribute to cumulative conditions at intersections, which would increase travel times and impact transit operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Feasibility of mitigation measures is unclear or would not completely avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing Variant would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Project impacts and Project contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Housing Variant impacts and Housing Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Project impacts and Project contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Project impacts and Project contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Project would also contribute to cumulative impacts on these transit routes on US-101.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
The existing game day service and transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The existing transit service and Housing Variant improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Housing Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Housing Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
The Housing Variant would result in construction-related transportation impacts in the Housing Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Housing Variant vicinity.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the Housing Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Housing Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
At the intersection of Tunnel/Blanken, the Housing Variant would result in significant Project AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Project/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Housing Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Project conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	<	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would contribute to significant traffic impacts on freeway conditions.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion and contribute to cumulative conditions at intersections, which would increase travel times and impact transit operations of the 23-Monterey, 24-Divisadero and the 44-O'Shaughnessy. Feasibility of mitigation measures is unclear or would not completely avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Project would also contribute to cumulative impacts on these transit routes on US-101.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Housing Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Housing Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
AIR QUALITY					
Operation of the Housing Variant would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Construction of the Housing Variant would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before construction activity on adjacent parcels is complete. Although the construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14 Comparison of the Significant and Unavoidable Impacts of Variant 2: No Stadium, Relocation of Housing to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Construction activities associated with the Housing Variant would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Operation of the Housing Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
CULTURAL RESOURCES					
The Housing Variant would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The Housing/R&D Variant would result in construction-related transportation impacts in the Housing/R&D Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Housing/R&D Variant vicinity.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the Housing/R&D Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Housing/R&D Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
At the intersection of Tunnel/Blanken, the Housing/R&D Variant would result in significant Project AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Housing/R&D Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Project conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant's contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Housing/R&D Variant contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Project conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge All*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing/R&D Variant would result in significant traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would contribute to significant traffic impacts on freeway conditions.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would contribute to significant cumulative traffic impacts at freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Project impacts and Project contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing/R&D Variant would increase congestion and contribute to cumulative conditions at intersections, which would increase travel times and impact transit operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Feasibility of mitigation measures is unclear or would not completely avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Project impacts and Project contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Housing/R&D Variant impacts and Housing/R&D Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Project impacts and Project contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge All*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Housing/R&D Variant would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Project impacts and Project contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Project would also contribute to cumulative impacts on these transit routes on US-101.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Housing/R&D Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/NI	SU/NI
The existing game day service and transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/NI	SU/NI

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Project conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing transit service and Housing/R&D Variant improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Housing/R&D Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Housing/R&D Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/SU	SU/SU
Sell-out weekday evening events at the arena could impact existing and proposed transit service.					
Significance of Alternative Compared to Variant	<	=	<	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/SU	SU/SU
AIR QUALITY					
Operation of the Housing/R&D Variant would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Construction of the Housing/R&D Variant would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before construction activity on adjacent parcels is complete. Although the construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-14a Comparison of the Significant and Unavoidable Impacts of Variant 2A: Housing/R&D Variant, No Stadium, Relocation of Housing, Additional R&D to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Construction activities associated with the Housing/R&D Variant would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Operation of the Housing/R&D Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	=	>	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	NI/NI	NI/SU	NI/NI	NI/NI	NI/NI
CULTURAL RESOURCES					
The Housing/R&D Variant would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement: No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The Tower Variants would result in construction-related transportation impacts in the Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Variant vicinity. Mitigation measure MM TR-1 would reduce but not avoid construction-related transportation impacts during construction activities. Therefore, construction transportation impacts would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the Tower Variants would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts. Although implementation of a Travel Demand Management Plan was assumed in developing Variant travel demand estimates, and would be essential to ensure that impacts at additional locations do not occur, traffic congestion caused by the Variant and the Variant's contribution to cumulative impacts would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
At the intersection of Tunnel/Blanken, the Tower Variants would result in significant AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Tower Variants contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Variant conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Tower Variants contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Tower Variants contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would result in significant Tower Variants traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would contribute to significant cumulative traffic impacts at four freeway segments. No feasible mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would contribute to significant cumulative traffic impacts at 12 freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Tower Variants would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Variant impacts and Variant contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion and contribute to cumulative conditions at intersections along Palou Avenue, which would increase travel times and impact operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Implementation of mitigation measure MM TR-22.1 and MM TR-22.2 would reduce impacts to transit operations. However, since feasibility of MM TR-22.1 is uncertain, and since MM TR-22.2, without MM TR-22A, would reduce, but not completely avoid, impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy, Variant impacts and Variant contributions to cumulative impacts on the these lines would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Variant impacts and Variant contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Variant impacts and Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Tower Variants would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Variant impacts and Variant contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Variant impacts and Variant contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Variant would also contribute to cumulative impacts on these transit routes on US-101. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Tower Variants would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Tower Variants' proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing game day service and Tower Variants transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Tower Variants conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing transit service and Tower Variants improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Tower Variants conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Tower Variants conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations. Implementation of mitigation measure MM TR-23.1 would reduce impacts to less than significant. Due to the uncertainty of this mitigation the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
SHADOW					
The Tower Variant would add shadows to Gilman Park during the hours between one hour after sunrise and one hour before sunset, with a new shadow load greater than 1.0 percent. This new shadow could have an adverse effect on the use of park. While Tower Variant A would not add shade after late morning or midday periods at any time of year, and the park would not be affected in afternoon periods of use, the shadow effect is conservatively considered to be a significant and unavoidable impact of Tower Variant C.					
Significance of Alternative Compared to Variant	<	<	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/NI	SU/NI	SU/NI	SU/NI
AIR QUALITY					
Operation of the Tower Variants would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out in the year 2029.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Construction of the Tower Variants would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before construction activity on adjacent parcels is complete. Although the construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Construction activities associated with the Tower Variants would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-15 Comparison of the Significant and Unavoidable Impacts of Variant 3: Candlestick Point Tower to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Operation of the Tower Variants would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that would adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
CULTURAL RESOURCES					
The Tower Variants would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina, or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge All*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The Utilities Variant would result in construction-related transportation impacts in the Utilities Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the Utilities Variant vicinity. Mitigation measure MM TR-1 would reduce but not avoid construction-related transportation impacts during construction activities. Therefore, construction transportation impacts would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the Utilities Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts. Although implementation of a Travel Demand Management Plan was assumed in developing Utilities Variant travel demand estimates, and would be essential to ensure that impacts at additional locations do not occur, traffic congestion caused by the Utilities Variant and the Utilities Variant's contribution to cumulative impacts would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
At the intersection of Tunnel/Blanken, the Utilities Variant would result in significant AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Utilities Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Variant conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Utilities Variant contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Utilities Variant contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would result in significant Variant traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would contribute to significant cumulative traffic impacts at four freeway segments. No feasible mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would contribute to significant cumulative traffic impacts at 12 freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Utilities Variant would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Variant impacts and Variant contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion and contribute to cumulative conditions at intersections along Palou Avenue, which would increase travel times and impact operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Implementation of mitigation measure MM TR-22.1 and MM TR-22.2 would reduce impacts to transit operations. However, since feasibility of MM TR-22.1 is uncertain, and since MM TR-22.2, without MM TR-22A, would reduce, but not completely avoid, impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy, Variant impacts and Variant contributions to cumulative impacts on the these lines would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Variant impacts and Variant contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Variant impacts and Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The Utilities Variant would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, Utilities Variant impacts and Utilities Variant contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Variant impacts and Variant contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Variant would also contribute to cumulative impacts on these transit routes on US-101. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The Utilities Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
For as many as 12 times a year 49ers games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing game day service and Utilities Variant transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Utilities Variant conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing transit service and Utilities Variant improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations. Implementation of mitigation measure MM TR-23.1 would reduce impacts to less than significant. Due to the uncertainty of this mitigation the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
AIR QUALITY					
Operation of the Utilities Variant would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SUSU	SU/SU	SU/SU
NOISE					
Construction of the Utilities Variant would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before construction activity on adjacent parcels is complete. Although the construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Construction activities associated with the Utilities Variant would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Operation of the Utilities Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that would adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
CULTURAL RESOURCES					
The Utilities Variant would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

Table VI-16 Comparison of the Significant and Unavoidable Impacts of Variant 4: Utilities to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
TRANSPORTATION					
The 49ers/Shared Stadium Variant would result in construction-related transportation impacts in the 49ers/Shared Stadium Variant vicinity due to construction vehicle traffic and roadway construction and would contribute to cumulative construction impacts in the 49ers/Shared Stadium Variant vicinity. Mitigation measure MM TR-1 would reduce but not avoid construction-related transportation impacts during construction activities. Therefore, construction transportation impacts would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
Implementation of the 49ers/Shared Stadium Variant would cause an increase in traffic that would be substantial relative to the existing and proposed capacity of the street system, and result in significant and unavoidable impacts. Although implementation of a Travel Demand Management Plan was assumed in developing 49ers/Shared Stadium Variant travel demand estimates, and would be essential to ensure that impacts at additional locations do not occur, traffic congestion caused by the 49ers/Shared Stadium Variant and the 49ers/Shared Stadium Variant's contribution to cumulative impacts would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would result in significant impacts and would contribute to significant cumulative impacts at intersections in the Variant vicinity where no feasible traffic mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
At the intersection of Tunnel/Blanken, the 49ers/Shared Stadium Variant would result in significant AM peak hour traffic impacts, and contribute to cumulative PM peak hour traffic impacts, for which a feasible mitigation measure has been identified. The identified mitigation measure would improve traffic operations, but not to acceptable levels of service.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
49ers/Shared Stadium Variant contributions at some study area intersections that would operate at LOS E or LOS F under 2030 No Variant conditions were determined to be significant, and no feasible mitigation measures have been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
49ers/Shared Stadium Variant contributions at the intersections of Geneva/US-101 Southbound Ramps and Harney/US-101 Northbound Ramps, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-6 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
49ers/Shared Stadium Variant contributions at the intersections of Bayshore/Geneva, which would operate at LOS F under 2030 No Variant conditions, were determined to be significant, and a mitigation measure has been identified to avoid this impact. However, implementation of mitigation measure MM TR-8 is uncertain, and this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would result in significant Variant traffic spillover impacts and contribute to cumulative traffic spillover impacts. The identified mitigation measures would reduce, but not avoid, traffic spillover impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would contribute to significant cumulative traffic impacts at four freeway segments. No feasible mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The 49ers/Shared Stadium Variant would result in significant impacts at four freeway on-ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would contribute to significant cumulative traffic impacts at 12 freeway ramp locations. No feasible traffic mitigation is available.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would result in significant impacts related to freeway diverge queue storage at the Harney/US-101 Northbound Off-ramp. Mitigation measure MM TR-6 has been identified to avoid this impact, but its implementation is uncertain. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would contribute to significant cumulative traffic impacts related to freeway diverge queue storage at some off-ramp locations. Mitigation measure MM TR-6 has been identified to avoid this impact at the US-101 Northbound off-ramp to Harney Way, and US-101 Southbound Off-ramp to Harney Way/Geneva Avenue. However, implementation is uncertain. For the other ramps, no feasible mitigations have been identified. Therefore, this impact would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion and contribute to cumulative conditions at intersections along San Bruno Avenue, which would increase travel times and impact operations of the 9-San Bruno. Implementation of mitigation measures MM TR-21.1 and MM TR-21.2 could reduce impacts to transit operations. However, since feasibility of MM TR-21.1 is uncertain, and since MM TR-21.2, without MM TR-21.1, would reduce, but not completely avoid, impacts on the 9-San Bruno, Variant impacts and Variant contributions to cumulative impacts on the 9-San Bruno would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion and contribute to cumulative conditions at intersections along Palou Avenue, which would increase travel times and impact operations of the 23-Monterey, 24-Divisadero, and the 44-O'Shaughnessy. Implementation of mitigation measure MM TR-22.1 and MM TR-22.2 would reduce impacts to transit operations. However, since feasibility of MM TR-22.1 is uncertain, and since MM TR-22.2, without MM TR-22A, would reduce, but not completely avoid, impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy, Variant impacts and Variant contributions to cumulative impacts on the these lines would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The 49ers/Shared Stadium Variant would increase congestion at intersections along Gilman Avenue and Paul Avenue, which would increase travel times and would impact operations of the 29-Sunset. Implementation of mitigation measures MM TR-23.1 and MM TR-23.2 would reduce impacts to transit operations. However, since feasibility of MM TR-23.1 is uncertain, and since MM TR-23.2, without MM TR-23.1, would reduce, but not completely avoid, impacts on the 29-Sunset, Variant impacts and Variant contributions to cumulative impacts on the 29-Sunset would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion at intersections along Evans Avenue, which would increase travel times and impact operations of the 48-Quintara-24th Street. Implementation of mitigation measures MM TR-24.1 and MM TR-24.2 would reduce impacts to transit operations. However, since feasibility of MM TR-24.1 is uncertain, and since MM TR-24.2, without MM TR-24.1, would reduce, but not completely avoid, impacts on the 48-Quintara-24th Street, Variant impacts and Variant contributions to cumulative impacts on the 48-Quintara-24th Street would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion at intersections in the study area, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the 54-Felton. Implementation of mitigation measure MM TR-25 would reduce, but not avoid impacts.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion at intersections along Third Street, and make a considerable contribution to cumulative impacts that would increase travel times and impact operations of the T-Third. Implementation of mitigation measures MM TR-26.1 and MM TR-26.2 would reduce impacts to transit operations. However, since feasibility of MM TR-26.1 is uncertain, and since MM TR-26.2, without MM TR-26.1, would reduce, but not completely avoid, impacts on the T-Third, 49ers/Shared Stadium Variant impacts and 49ers/Shared Stadium Variant contributions to cumulative impacts on the T-Third would remain significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion at the intersection of Geneva Avenue and Bayshore Boulevard. This would increase travel times and impact operations of the 28L-19th Avenue/Geneva Limited. Implementation of mitigation measures MM TR-27.1 and MM TR-27.2 would reduce impacts to transit operations. However, since feasibility of MM TR-27.1 is uncertain, and since MM TR-27.2, without MM TR-27.1, would reduce, but not completely avoid, impacts on the 28L-19th Avenue/Geneva Limited, Variant impacts and Variant contributions to cumulative impacts on the 28L-19th Avenue/Geneva Limited would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The 49ers/Shared Stadium Variant would increase congestion on US-101 mainline and ramps, which would increase travel times and impact operations of the 9X, 9AX, 9BX-Bayshore Expresses, and 14X-Mission Express. The Variant would also contribute to cumulative impacts on these transit routes on US-101. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant would increase congestion and contribute to cumulative congestion on US-101 and on Bayshore Boulevard, which would increase travel times and adversely affect operations of SamTrans bus lines on these facilities. No feasible mitigation has been identified.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU
The 49ers/Shared Stadium Variant's proposed transit preferential treatments and significant increases in traffic volumes on Palou Avenue would result in impacts on bicycle travel on Bicycle Routes #70 and #170 between Griffith Street and Third Street. The effectiveness of mitigation is uncertain. Therefore, the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/SU	SU/SU
For as many as 24 times a year 49ers/Raiders games at the proposed stadium would result in significant impacts on study area roadways and intersections. Implementation of mitigation measure MM TR-38 would lessen game-day impacts; however, traffic impacts would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
The existing game day service and 49ers/Shared Stadium Variant transit improvements would not be adequate to accommodate projected transit demand. Implementation of mitigation measure MM TR-39 would reduce game-day impacts on transit capacity; however, traffic impacts on transit operations would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening secondary events at the stadium would result in increased congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under 49ers/Shared Stadium Variant conditions without a secondary event, and result in significant impacts at nine additional intersections and one additional freeway off-ramp. Implementation of mitigation measure MM TR-46 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
The existing transit service and 49ers/Shared Stadium Variant improvements would not be adequate to accommodate projected transit demand during secondary events with attendance of 37,500 spectators. In addition, transit lines serving the area would experience additional delays due to traffic generated by the secondary event.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
Weekday evening events at the arena would exacerbate congestion at intersections, freeway mainline, and freeway ramps already operating at unacceptable LOS under Variant conditions without an arena event, and result in significant traffic impacts at Harney Way and Jamestown Avenue, which was operating acceptably under Variant conditions without an arena event. Mitigation measure MM TR-51 would reduce but not avoid impacts.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
Sell-out weekday evening events at the arena would be accommodated within the existing and proposed transit service. However, traffic congestion would impact transit operations. Implementation of mitigation measure MM TR-23.1 would reduce impacts to less than significant. Due to the uncertainty of this mitigation the impact would remain significant.					
Significance of Alternative Compared to Variant	<	=	<	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/SU
AIR QUALITY					
Operation of the 49ers/Shared Stadium Variant would violate BAAQMD CEQA significance thresholds for mass criteria pollutant emissions from mobile and area sources and contribute substantially to an existing or projected air quality violation at full build-out.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
NOISE					
Construction of the 49ers/Shared Stadium Variant would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before construction activity on adjacent parcels is complete. Although the construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 and 2908 of the *Municipal Code*, vibration levels would still be significant.					
Significance of Alternative Compared to Variant	=	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/SU	SU/SU	SU/SU	SU/SU	SU/SU

Table VI-17 Comparison of the Significant and Unavoidable Impacts of Variant 5: 49ers/Raiders Shared Stadium to Each of the Alternatives

	Alternative 1 No Project[a]	*Alternative 2 No Bridge Alt*[b]	*Alternative 3 49ers at Candlestick*[c]	*Alternative 4 Lesser Build with Historic Preservation*[d]	*Alternative 5 No Park Agreement*[e]
Construction activities associated with the 49ers/Shared Stadium Variant would result in a substantial temporary or periodic increase in ambient noise levels.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Operation of the 49ers/Raiders Shared Stadium Variant would generate increased local traffic volumes that would cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes.					
Significance of Alternative Compared to Variant	<	=	=	=	=
Level of Significance after Mitigation (Variant/Alternative)	SU/LTS	SU/SU	SU/SU	SU/SU	SU/SU
Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that would adversely affect surrounding residents for the duration of a game or concert.					
Significance of Alternative Compared to Variant	<	=	<	<	<
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/NI	SU/NI	SU/NI
CULTURAL RESOURCES					
The 49ers/Raiders Shared Stadium Variant would result in a substantial adverse change in the significance of a historical resource. Implementation of mitigation measure MM CP-3b would reduce the impact, but not to a less-than-significant level. The impact would be significant and unavoidable.					
Significance of Alternative Compared to Variant	<	=	=	<	=
Level of Significance after Mitigation (Variant/Alternative)	SU/NI	SU/SU	SU/SU	SU/LTS	SU/SU

< Alternative does lessen the severity of the impact
> Alternative increases the severity of the impact
= Alternative impact is similar to the Project impact
NI = No Impact
LTS = Less-Than-Significant impact
SU = Significant and Unavoidable Impact

a. No Project
b. CP-HPS Phase II Development Plan, HPS Phase II Stadium, State Parks Agreement, and without the Yosemite Slough Bridge
c. Reduced CP-HPS Phase II Development, San Francisco 49ers Stay at Existing Candlestick Park Stadium, with Limited State Parks Agreement, and Yosemite Slough Bridge Serving Only Transit, Bicycles, and Pedestrians
d. Reduced CP-HPS Phase II Development; Historic Preservation; State Parks Agreement; No HPS Phase II Stadium, Marina or Yosemite Slough Bridge
e. Reduced CP-HPS Phase II Development, No HPS Phase II Stadium, No State Parks Agreement, and without the Yosemite Slough Bridge

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CHAPTER VIII **Acronyms/Abbreviations and Glossary**

VIII.A ACRONYMS/ABBREVIATIONS

Acronym/ Abbreviation	*Definition*
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
AB 32	California Global Warming Solutions Act of 2006
ABAG	Association of Bay Area Governments
ACB	Articulated Concrete Block
ACBM	Asbestos Containing Building Materials
ACORN	Association of Community Organizations for Reform Now
ADA	American Disabilities Act
ADMP	Asbestos Dust Mitigation Plan
ADRP	Archaeological Data Recovery Plan
AEP	Association of Environmental Professionals
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Agency	San Francisco Redevelopment Agency
Agency Commission	San Francisco Redevelopment Agency Commission
AGO	California Attorney General's Office
ALS	Advanced Life Support
AMI	Area Median Income
AMP	Archaeological Monitoring Program
ANSI	American National Standards Institute
AOC	Administrative Order of Consent
ARB	California Air Resources Board
ARDTP	Agency for Toxic Substances and Disease Registry
ARIC	Area Requiring Institutional Controls
AST	Above-Ground Storage Tank
AT&T Park	San Francisco Giants Ballpark
ATCM	Asbestos Airborne Toxic Control Measure
ATP	Archaeological Testing Plan
ATSDR	Agency for Toxic Substances and Disease Registry
AWSC	All-Way Stop Controlled
AWSS	Auxiliary Water Supply System
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Basin Plan	San Francisco Bay Basin Water Quality Control Plan
BASMAA	Bay Area Stormwater Management Agencies Association
BAT	Best Available Technology Economically Achievable
BAU	Business as Usual

Acronym/ Abbreviation	*Definition*
Bay	San Francisco Bay
Bay Area	San Francisco Bay Area
Bay Plan	San Francisco Bay Plan
Bay Trail	San Francisco Bay Trail
Bay Trail Plan	*San Francisco Bay Trail Plan*
BayCAMP	Bayview Community Air Monitoring Project
BCDC	San Francisco Bay Conservation and Development Commission
BCT	Best Conventional Pollutant Control Technology
BERA	Baseline Ecological Risk Assessment
BFE	Base Flood Elevation
BIT	Bayview Industrial Triangle
BLIP	Branch Library Improvement Program
BLS	Basic Life Support
BMPs	Best Management Practices
Board of Supervisors	San Francisco Board of Supervisors
BOE	Bureau of Engineering
Boundaries Analysis	San Francisco Police Department District Station Boundaries Analysis
BRAC	Base Realignment and Closure
Brisbane Baylands North	Brisbane Baylands Future Phase Area
Brisbane Baylands South	Brisbane Baylands Phase I Specific Plan Area
BRT	Bus Rapid Transit
BTI	Bayview Transportation Improvements
BTIP	Bayview Transportation Improvements Project
BVHP	Bayview Hunters Point
BVHP Area Plan	Bayview Hunters Point Area Plan
BVHP Redevelopment Plan	Bayview Hunters Point Redevelopment Plan
BWWF	Bayside Wet Weather Facilities
C&D	Construction and Demolition
C&R	Comment and Response
C-1 Baylands	Commercial Mixed-Use Zoning District
C_2F_6	PFC: Hexafluoroethane
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAC	Citizens Advisory Committee
CAFE	Corporate Average Fuel Economy
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Department of Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	Climate Action Plan (as used in the Greenhouse Gas Emissions section)
CAP	Corrective Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARE	Community Air Risk Evaluation
CAT	Climate Action Team
CBC	California Building Code
CCAR	California Climate Action Registry

Acronym/ Abbreviation	*Definition*
CCBA	Core Community Benefits Agreement
CCCC	California Climate Change Center
CCR	California Code of Regulations
CCSF	City and County of San Francisco
CCTA	Contra Costa Transportation Authority
CDC	Centers for Disease Control
CDFG	California Department of Fish and Game
CDPH	California Department of Public Health
CDPR	California Department of Parks and Recreation
CEC	California Energy Commission
CEG	Certified Engineering Geologist
Central Bay	San Francisco Bay Central
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Cleanup and Liability Act
CESA	California Endangered Species Act of 1984
CEUS	California Commercial End-Use Survey
CF_4	PFC: Tetrafluoromethane
CFCs	Chlorofluorocarbons
CFD	Community Facilities District
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CHP	California Highway Patrol
CIE	Cultural/Institutional/Educational
City	City and County of San Francisco
CIWMB	California Integrated Waste Management Board
CMP	Congestion Management Program
CMTP	Construction Management Traffic Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CNRA	California Natural Resources Agency
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COG	Council of Governments
Concept Plan	Bayview Hunters Point Community Revitalization Concept Plan
Construction General Permit	NPDES General Permit for Storm Water Discharges Associated with Construction Activity
Corps	United States Army Corps of Engineers
CP	Candlestick Point
CP-HPS Phase II	Candlestick Point–Hunters Point Shipyard Phase II
CPSRA	Candlestick Point State Recreation Area
CPSRA General Plan	Candlestick Point State Recreation Area General Plan
CPUC	California Public Utilities Commission
CPX	Candlestick Point Downtown Express

Acronym/ Abbreviation	*Definition*
CRHR	California Register of Historic Resources
CSLC	California State Lands Commission
CSMP	Construction Site Monitoring Program
CSO	Combined Sewer Overflow
CTC	California Transportation Commission
CTMP	Construction Transportation Management Plan
CTTP 2000	Census 2000 Transportation Planning Package
CWA	Clean Water Act of 1977
CY	Cubic Yards
D4D	Design for Development
dBA	A-weighted decibel scale
DBH	Diameter at Breast Height
DBI	Department of Building Inspection
DCP	Dust Control Plan
DDA	Disposition and Development Agreement
DDC	Deep Dynamic Compaction
DDT	Dichlro-diphenyl-trichloroethane
DEIS	Draft Environmental Impact Statement
Demand Report	2004 San Francisco Retail Water Demands and Conservation Potential Report
DHS	California Department of Health Services
DMMO	Dredged Material Management Office
DOD	Department of Defense
DOE	United States Department of Energy
DOT	United States Department of Transportation
DPH	Department of Public Health
DPM	Diesel Particulate Matter
DPR	California Department of Parks and Recreation
DPS	Distinct Population Segment
DPW	Department of Public Works
DTSC	California Department of Toxic Substances Control
Dust Ordinance	Construction Dust Control Ordinance
DWR	Department of Water Resources
EAM	Early Action Measure
eb	East Bound
EC	Elemental carbon
EE	Environmental Evaluation
EFH	Essential Fish Habitat
EHS	Electromagnetic hypersensitivity
EHSP	Environmental Health and Safety Plan
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EMFAC	Emission Factor Model
EMS	Emergency Medical Services
EMS	Environmental Management System (as used in the Utilities section)

Acronym/ Abbreviation	*Definition*
ENA	Exclusive Negotiations Agreement
ENVIRON	ENVIRON International Corporation
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
ERM	Effects Range Median
ERO	Environmental Review Officer
ESA	Environmental Site Assessment (as used in the Hazards and Hazardous Materials section)
ESA	Endangered Species Act (as used in the Biological Resources section)
ESCP	Erosion and Sediment Control Plan
ESUs	Evolutionary Significant Units
ETCA	Early Transfer Cooperation Agreement
F	Fahrenheit
FAA	Federal Aviation Administration
FAC	Facultative
FACW	Facultative Wetland
FARR	Final Archaeological Resources Report
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act of 1973
FFA	Federal Facilities Agreement
FHWA	Federal Highway Administration
Findings	Findings of Fact
FIRM	Flood Insurance Rate Map
FMP	Fisheries Management Plan
FOSET	Finding of Suitability for Early Transfer
FOSL	Finding of Suitability to Lease
FOST	Finding of Suitability Transfer
FS	Feasibility Study
FTA	Federal Transit Administration
FTE	Full-time Equivalent
g	Gravity
GCMs	General Circulation Models
GE	California Registered Geotechnical Engineer
General Plan	San Francisco General Plan
Geomatrix	Geomatrix Consultants, Inc.
GGBHTD	Golden Gate Bridge, Highway, and Transportation District
GGNRA	Golden Gate National Recreation Area
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMP	Gas Monitoring Probe
GP Guidelines	General Plan Guidelines 2003
GPM	Gallons Per Minute
GPR	Green Point Rated
GPRC	Geotechnical Peer Review Committee
GRACE	Gravity Recovery and Climate Experiment
gsf	Gross Square Feet

Acronym/ Abbreviation	*Definition*
GWP	Global Warming Potential
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HASP	Health and Safety Plan
HBO	Home Based Other Trip
HBS	Home Based Shopping
HBW	Home Based Work
HCD	Housing and Community Development
HCM	Highway Capacity Manual
HCM	Highway Capacity Manual
HFCs	Hydrofluorocarbons
HHRA	Human Health Risk Assessment
HHWP	Hetch Hetchy Water and Power
HI	Hazard Index
HMBP	Hazardous Materials Business Plan
HMFRA	Housing and Fair Market Development Metro Fair Market Rent Area
Housing Program	Citywide Tax Increment Housing Program
Housing Variant	Variant 2: No Stadium – Housing Variant
HOV	High Occupancy Vehicle
HPRP	Hunters Point Redevelopment Plan
HPS	Hunters Point Shipyard
HPS Phase II	Hunters Point Shipyard Phase II
HPS Redevelopment Plan	Hunters Point Shipyard Redevelopment Plan
HPX	Hunters Point Shipyard Downtown Express
HR 2764	The Consolidated Appropriations Act of 2008
HRA	Historical Radiological Assessment
HRE	Historic Resource Evaluation
HSRA	High-Speed Rail Authority
HTL	High Tide Level
HUD	US Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
I-280	Interstate 280
IB	India Basin
IBC	International Building Code
IBIP	India Basin Industrial Park
ICBO	International Conference of Building Officials
ICC	International Code Council
ICs	Institutional Controls
IEPR	Integrated Energy Policy Report
Industrial General Permit	NPDES General Industrial Permit for Discharges of Storm Water Associated with Industrial Activities
Interim CIP	Wastewater Enterprise Interim Capital Improvement Program
IPCC	Intergovernmental Panel on Climate Change
IR Sites	Installation Restoration Sites
IRP	Installation Restoration Program

Acronym/ Abbreviation	*Definition*
IS	Initial Study
ITE	Institute of Transportation Engineers
ITL	Interim Target Level
JARPA	Joint Aquatic Resources Permit Applications
JPB	The Peninsula Corridor Joint Powers Board
K	Kindergarten (as used in the Public Services section)
KJ	Franciscan Complex
Kyoto Protocol	United Nations' Framework Convention on Climate Change Agreement
lbs	pounds
LCA	Life Cycle Assessment
LCFS	Low Carbon Fuel Standard
LEED®	Leadership in Energy and Environmental Design
Lennar Urban	Lennar/Bayview Hunters Point Limited Liability Corporation
L_{eq}	Average Noise Level
LID	Low Impact Development
LIFOC	Lease in Furtherance of Conveyance
L_{max}	Highest Peak Noise
L_n	Statistical Sound Level
LOMR-F	Letter of Map Revision Based on Fill
LOS	Level of Service
Lower Bay	San Francisco Bay Lower
LRT	Light Rail Transit
LRV	Light-Rail Vehicle
LRV	Light Rail Vehicle
LTMS	Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region
LTS	Less-Than-Significant Impact
LTS/M	Less-Than-Significant Impact with Mitigation
LUCRD	Land Use Control Remedial Designs
LUPs	Linear Underground/Overhead Projects
LWCF	Land and Water Conservation Fund
LWCFA	Land and Water Conservation Fund Act of 1965
M	Moment Magnitude (as used in the Geology and Soils section)
M	Manufacturing
M-1	Light Industrial District
M-2	Heavy Industrial District
MBRs	Membrane Bioreactors
MBTA	Migratory Bird Treaty Act
MBtu	Million British Thermal Units
MC	Motor Coach
MEA	Major Environmental Analysis
MED	Medical and Health Services
MEI	Maximally Exposed Individual
MEP	Maximum Extent Practicable (as used in the Hydrology and Water Quality section)

Acronym/ Abbreviation	*Definition*
MEP	Maximum Extent Possible (as used in the Hydrology and Water Quality section)
MGD	Million Gallons per Day
MHW	Mean High Water
MID	Modesto Irrigation District
MIP	Management and Information Professional Services
Mitigation Monitoring Plan	Wetland and Jurisdictional Waters Mitigation Monitoring Plan
MLD	Most Likely Descendant
MLLW	Mean Lower Low Water
MM	Mitigation Measure
MMI	Modified Mercalli Intensity
MMPA	Marine Mammal Protection Act
MMRP	Mitigation Monitoring and Report Program
$MMTCO_2E$	Million Metric Tons of CO_2-Equivalent
MOA	Memorandum of Agreement
MPH	Miles per hour
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
MSA	Magnuson-Stevens Act
MT	Metric Tonnes
MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation System
MU	Mixed-Use
Muni	San Francisco Municipal Railway
Municipal Stormwater General Permit	Phase II NPDES General Permit for the Discharge of Storm Water from Small MS4s
N_2O	Nitrous Oxide
NAHC	Native American Heritage Commission
NALs	Technology-Based Numeric Action Levels
NASA	National Aeronautics and Space Administration
NAT	No Action Taken
NAVD88	North American Vertical Datum of 1988
Navy	United States Navy
nb	North Bound
NC	Neighborhood Commercial
NC-1	Neighborhood Commercial Cluster
NC-2	Small-Scale Neighborhood Commercial
NCD-IB	Neighborhood Commercial District, India Basin
NCP	National Contingency Plan
NEHRP	National Earthquake Hazards Reduction Program
NELs	Technology-Based Numeric Effluent Limitations
NEP	New Expenditure Plan
NEPA	National Environmental Policy Act
NFA	No Further Action
NFIP	National Flood Insurance Program

Acronym/ Abbreviation	*Definition*
NFL	National Football League
NGVD29	National Geodetic Vertical Datum
NHB	Non-home Based
NHPA	National Historic Preservation Act of 1966
NHTSA	National Highway Traffic Safety Administration
NI	No Impact
NMFS	National Marine Fisheries Services
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPRA	National Parks and Recreation Association
NPS	National Park Service
NPSs	Nonpoint Sources (as used in the Hydrology and Water Quality section)
NPWWF	North Point Wet Weather Facility
NRC	National Resource Council
NRDL	Naval Radiological Defense Laboratory
NRHP	National Register of Historic Places
NSC	No Significant Contribution
NSMCSD	North San Mateo County Sanitation District
NTP	Neighborhood Transportation Plan
NURP	Nationwide Urban Runoff Program
NWIC	California Archaeological Site Survey Northwest Information Center
O&G	Oil and Grease
O_3	Ozone
OAL	Office of Administrative Law
OBL	Obligate
°F	degrees Fahrenheit
OHW	Ordinary High Water
OPA	Owner Participation Agreement
OPR	California Office of Planning and Research
OS	Open Space
OSHA	Occupational Safety and Health Agency
P	Public
PA	Programmatic Agreement
PA	Public Address System (as used in the Noise and Vibration section)
PA&ED	Project Approval and Environmental Document
PA/SI	Preliminary Assessment and Site Identification
PAC	Bayview Hunters Point Project Area Committee
PAHs	Polycyclic Aromatic Hydrocarbons
Pathogens	Bacteria and Viruses
Pb	Lead

Acronym/ Abbreviation	*Definition*
pc/h	Passenger cars per hour
pc/mi/ln	Passengers cars per mile per lane
PCBs	Polychlorinated Biphenyls
PCC	Portland Concrete Cement
PCEs	Primary Constituent Elements
PCOs	Parking Control Officers
PCWQCA	Porter-Cologne Water Quality Control Act
PDF	Project Design Feature
PDR	Production, Distribution, and Repair
PDT	Pacific Daylight Time
PE	Professional Engineer
PEIR	Program Environmental Impact Report
Peninsula	San Francisco Bay Area Peninsula
PFCs	Perfluorocarbons
PG&E	Pacific Gas and Electric
Phase I ESA	Phase I Environmental Site Assessment
PI	Project Impact
Pier 80 Outfall	Southeast Pollution Control Outfall
Planning Code	San Francisco Planning Code
Planning Commission	San Francisco Planning Commission
Planning Department	San Francisco Planning Department
PM	Particle Matter
PM_{10}	Respirable Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
Port	Port of San Francisco
ppm	Parts per Million
PPRF	Pulse Plasma Rock Fragmentation
PRC	Public Resources Code
PRDs	Permit Registration Documents
PRMMP	Paleontological Resources Monitoring and Mitigation Program
Project	Candlestick Point – Hunters Point Shipyard Phase II Development Plan Project
PSSG	Public Safety Strategies Group
PST	Pacific Standard Time
PV	Photovoltaic
Qaf	Artificial Fill
Qc	Colma Formation
Qm	Bay Mud Deposits
QMS	Quality Management System
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner
Qsr	Slope Debris and Revise Fill
Qu	Undifferentiated Sedimentary Deposits
R Value	Rainfall Erosivity Value
R&D	Research and Development
R&D Variant	Variant 1: No Stadium – Additional Research and Development Variant

Acronym/ Abbreviation	*Definition*
RAP	Rammed Aggregate Piers
RBCA	Risk Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
REAP	Rain Event Action Plan
REB	Resource Efficient Building
RECs	Recognized Environmental Conditions
Recycled Water General Permit	General Waste Discharge Requirements for Landscaping Irrigation Uses of Municipal Recycled Water
RET	Retail
RFS	Renewable Fuel Standard
RFS	Renewable Fuel Standard
RH-1	Residential House One-Family District
RH-1D	Residential House Character District
RH-2	Residential House Two-Family District
RHNA	Regional Housing Needs Assessment
RHNP	Regional Housing Needs Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RIC	Rapid Impact Compaction
RM-1	Residential, Mixed District
RM-2	Residential, Mixed Moderate Density District
RMP	Risk Management Plan
ROD	Record of Decision
ROG	Reactive Organic Gas
ROWD	Report of Waste Discharge
RPD	San Francisco Recreation and Park Department
RPP	Residential Permit Parking
RPS	Renewables Portfolio Standard
RTAC	Regional Targets Advisory Committee
RTPs	Regional Transportation Plans
RUSLE	Revised Universal Soil Loss Equation
RV	Recreational Vehicle
RWMP	Recycled Water Master Plan
RWQCB	Regional Water Quality Control Board
RWS	Regional Water System
RWSAP	Retail Water Shortage Allocation Plan
SACOG	Sacramento Area Council of Governments
SamTrans	San Mateo County Transit Districts
SAP	Special Area Plan
SB	Senate Bill
sb	South Bound
SC	Specific Conductance
SC	Standard Condition (as used in the Climate Change section)
SC/PI	Significant Contribution/Project Impact
SCBA	Self-Contained Breathing Apparatus

Acronym/ Abbreviation	*Definition*
SCC	California State Coastal Conservancy
SCP	Stormwater Control Plan
SDMP	Stormwater Drainage Master Plan
Seaport Plan	San Francisco Bay Area Seaport Plan
SF_6	Sulfur Hexafluoride
SFAB	San Francisco Bay Area Air Basin
SFBC	San Francisco Building Code
SFCAP	San Francisco Climate Action Plan
SFCD	San Francisco City Datum
SF-CHAMP	San Francisco County's travel demand model
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SFDPW	San Francisco Department of Public Works
SFEI	San Francisco Estuary Institute
SFFD	San Francisco Fire Department
SFGSP	San Francisco Groundwater Supply Project
SFHA	San Francisco Housing Authority
SFHA	Special Flood Hazard Area (as used in the Hydrology and Water Quality section)
SFMTA	The San Francisco Municipal Transportation Agency
SFO	San Francisco International Airport
SFPD	San Francisco Police Department
SFPL	San Francisco Public Library
SFPUC	San Francisco Public Utilities Commission
SFRPD	San Francisco Recreation and Park Department
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SFUSD	San Francisco Unified School District
SGMP	Soil and Groundwater Management Plan
SHPO	State Historic Preservation Officer
SI	Site Identification
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SLERA	Screening-Level Ecological Risk Assessment
SO_2	Sulfur Dioxide
SoMa	South of Market
SP	Service Population
SPP	Spill Prevention Plans
SPT	Standard Penetration Test
SRA	State Recreation Area
SRRE	Source Reduction and Recycling Element
SSSC	Side-Street Stop Controlled
Stormwater Design Guidelines	Draft San Francisco Stormwater Design Guidelines
SU	Significant and Unavoidable Impact
SUD	Special Use District
SVE	Soil Vapor Extraction System

Acronym/ Abbreviation	*Definition*
SVOCs	Semi-Volatile Organic Compounds
SVP	Society for Vertebrate Paleontology
SWIS	Solid Waste Information
SWMP	Site Waste Management Plan (as used in the Utilities section)
SWMP	Stormwater Management Plan (as used in the Hydrology and Water Quality section)
SWPCP	Southeast Water Pollution Control Plant
SWPPP	Storm Water Pollution Prevention Plans
SWRCB	State Regional Water Quality Control Board
TAC	Toxic Air Contaminants
TAR	Third Assessment Report
TAZ	Traffic Analysis Zones
TBD	To Be Determined
TC	Trolley Coach
TCRA	Time Critical Removal Action
TDM	Transportation Demand Management
TDM Plan	Transportation Demand Management Plan
TDS	Total Dissolved Solids
TEP	Transit Effectiveness Project
TEPHd	Total Extractable Petroleum Hydrocarbons as Diesel
Tg	Teragram
TMDL	Total Maximum Daily Load
TMP	Transportation Management Plan
TNM	Traffic Noise Model
TOC	Total Organic Carbon
Tower Variants	Candlestick Point Tower Variants
TPH	Total Petroleum Hydrocarbons
TPS	Transit Preferential Street
TPS	Transit Preferential Street
Triple A	Triple A Machine Shop
TSDs	Treatment, Storage, and Disposal Facilities
TSS	Total Suspended Solids
UCSF	University of California, San Francisco
UPC	Universal Paragon Corporation
URBEMIS	Urban Emissions Model
US	United States
US DOT	United States Department of Transportation
USEPA Levels	Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety
US-101	United States Highway 101
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
USGS	United State Geological Survey

Acronym/ Abbreviation	*Definition*
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
v/c	Volume/Capacity
VCA	Voluntary Cleanup Agreement
VdB	Vibration Decibels
VDECS	Verified Diesel Emission Control Strategies
VIS	Visitor Lodging
VMT	Vehicle Miles Traveled
VOCs	Volatile Organic Compounds
VOR	Vehicle Occupancy Rate
VTA	Santa Clara Valley Transportation Authority
V-Zones	Coastal High Hazard Areas
Waterfront Plan	Port of San Francisco Waterfront Land Use Plan
wb	West Bound
WDR	Waste Discharge Requirement
WEPA	Worker Environmental Awareness Program
WETA	San Francisco Bay Area Water Emergency Transportation Agency
WETA	Water Emergency Transit Authority
WHO	World Health Organization
WSA	Water Supply Assessment
WSAP	Water Shortage Allocation Plan
WSAS	Water Supply Availability Study
WSIP	Water Supply Improvement Program
WTP	Water Treatment Plant
WWII	World War II
XII	Total Destruction on the Modified Mercalli Intensity Scale
ZVI	Zero-Valent Iron

VIII.B GLOSSARY

Alluvial: A loose deposit of gravel, sand, mud, etc., formed by flowing water.

Alquist-Priolo Earthquake Fault Zone: In 1972 the State of California began delineating special studies zones (called Earthquake Fault Zones since January 1994) around active and potentially active faults in the state. The zones are revised periodically, and extend 200 to 500 feet on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 feet on either side of an active fault trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction in the Earthquake Fault Zone is permitted only following the completion of a fault location report prepared by a California-registered professional Geologist

Ambient: The lowest sound level repeating itself during a minimum 10-minute period as measured with a type 1, precision sound level meter, set on slow response and A-weighting.

Analytical Practical Quantification Limit: The lowest level of certainty that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Ballast Water: Water used to weight a ship to the water's surface, preventing toppling during heavy winds.

Basement Rock: Refers to the thick foundation of ancient and oldest metamorphic and igneous rock that forms the crust of continents. Sedimentary rocks are laid down on top of basement rock after the continents form. Some basement rock is visible from the surface, such as at the bottom of the Grand Canyon.

Break-bulk Cargo: A shipping term for any loose material that must be loaded individually, not in shipping containers or in bulk as with oil or grain.

Btu: Approximately the amount of energy needed to heat one pound of water one degree Fahrenheit.

Bulkhead Site: The area between the waterfront roadway and the pier or water. Many bulkhead sites house structures that provide entrances to the piers.

Cancer risk: Calculated approximation of the probability of an individual developing cancer as a result of exposure to a cumulative dose of a potential carcinogen based on estimated or measured concentrations in soil, groundwater, or air and a potency factor specific to that carcinogen.

Carbon Monoxide: A colorless, odorless gas produced by the incomplete combustion of fuels.

Carcinogen: Cancer-causing.

Characteristic Earthquake: Characteristic earthquakes are repeat earthquakes that have the same faulting mechanism, magnitude, rupture length, location, and, in some cases, the same epicenter and direction of rupture propagation as earlier shocks. As used in this report, the moment magnitude (M) of the "characteristic earthquake" indicates the scale of the seismic event considered representative of a particular fault segment, based on seismologic observations and statistical analysis of the probability that a larger earthquake would not be generated during a given time frame (often 50 or 100 years). In the Bay Area, the characteristic earthquake for the Peninsula segment of the San Andreas Fault has a moment magnitude (M) of 7.3; the Northern and Southern segments of the Hayward fault, an M of 6.9; and the Calaveras fault, M 6.2. The term "characteristic earthquake" replaces the term "maximum credible earthquake" as a more reliable descriptor of future fault activity (Working Group on California Earthquake Probabilities, *Earthquake Probabilities in the San Francisco Bay Region: 2002–2031*, USGS Open-File Report 2003-214, 2003).

Chronic exposure: Repeated doses of or exposure to a substance over a relatively prolonged period of time (i.e., many years versus a few days).

Colluvial: A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.

Combined Sewer Overflow (CSO): An overflow is a pipe that discharges flows that exceed the capacity of the combined sewer system during very heavy rain. Such discharges receive primary (flow-through) treatment in underground storage/transport boxes. Overflow events are relatively rare in San Francisco.

Densification: Increasing the density of soil.

Detention: Slowing down, temporary storing, and releasing stormwater runoff at a controlled rate.

Dose: The amount of a chemical substance to which an organism is exposed.

Draft Final 2005 Industrial General Permit: Contains parameter benchmark concentrations for constituents commonly found in stormwater runoff from industrial facilities (indicator parameters), which are derived from USEPA's Multi-Sector General Permit.

Dual plumbing: A system of separated water and wastewater lines.

Effects Range Median (ERM): The concentration above which effects are frequently or always observed among most species of biota.

Embayment: A small bay or any small semi-enclosed coastal water body whose opening to a large body of water is restricted.

ENERGY STAR: A joint program of the US Environmental Protection Agency and the US Department of Energy that sets energy efficiency guidelines for appliances and homes.

Estuarine: The part of the mouth or lower course of a river in which the river's current meets the sea's tide.

Exposure pathway: The course a chemical or pollutant takes from the source to the organism exposed. A complete exposure pathway consists of four elements: chemical sources, migration routes (i.e., transport in the environment), an exposure point for contact (i.e., soil, air, or, water); and exposure routes. An exposure pathway is not complete unless all four elements are present.

Exposure route: The way a chemical or pollutant enters the organism after contact. Four exposure routes are recognized in risk evaluation methods: ingestion, inhalation, dermal (skin and eye), and injection.

Extremely hazardous substance: In the context of *Public Resources Code* Section 21151.4 pertaining to hazardous materials emissions near schools, this refers to a material included on lists compiled pursuant to Section 25532 of the *California Health and Safety Code*, which incorporates regulated toxic and flammable substances under Section 112(r) of the federal *Clean Air Act* Table 3 of Section 112(r) lists those regulated substances pursuant to Section 25532(g)(2) of *California Health and Safety Code*. Threshold quantities for listed toxic and flammable substances are specified in the tables.

Fault Creep: Movement along a fault that does not entail earthquake activity.

Fine Particulate Matter: Extremely small, suspended particles or droplets 2.5 microns or smaller in diameter.

Fixed Source: A machine or device capable of creating a noise level at the property upon which it is regularly located, including but not limited to: industrial and commercial process machinery and equipment, pumps, fans, air-conditioning apparatus or refrigeration machines.

Floodway: The stream channel and portion of the adjacent floodplain that must remain open to permit passage of the base flood.

Foot-candle: A unit of light intensity that represents the illumination given off by a single candle at a distance of one foot.

Re-gunning crane: A type of crane used in shipbuilding and repair that is particularly suited to lift heavy objects such as ship engines.

General Plan: The General Plan, adopted by the City Council or local governing board after public hearings and citizen input, is a comprehensive, long-range policy document that guides the ultimate physical development of a city or local government.

Geogrid: Synthetic fabric (fiberglass, polyester, treated steel, etc.) formed into nets with openings more than ¼ inch in size to allow the fabric to interlock with surrounding soil, rock, and other below-ground-level materials and to function as reinforcement.

Granular: Made up of very small grains.

Ground Acceleration: The speed at which soil or rock materials are displaced by seismic waves. It is measured as a percentage of the acceleration of gravity (0.5g = 50 percent of 32 feet per second squared, expressed as a vertical or horizontal force). *Peak* ground acceleration is the maximum acceleration expected from the characteristic earthquake predicted to affect a given area. Repeatable acceleration refers to the acceleration resulting from multiple seismic shocks. Sustained acceleration refers to the acceleration produced by continuous seismic shaking from a single, long-duration event.

Hazard Index (HI): The calculated ratio of predicted acute or chronic exposure of noncarcinogenic substance to a toxicity reference dose level for that particular substance. A Hazard Index (HI) threshold of 1 has been established by most regulatory agencies, including the RWQCB and BAAQMD for comparison purposes. Adverse health effects are not anticipated when chronic and acute hazard indices are less than one.

Hazard: Any situation that has the potential to cause damage to human health or the environment.

Hazardous air emission: In the context of *Public Resources Code* Section 21151.4 pertaining to hazardous materials emissions near schools, this refers to a material included on the list of hazardous air emissions (toxic air contaminants) established by the California Air Resources Board per Section 44321 of the *California Health and Safety Code*.

Hazardous material: Any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment (*California Health and Safety Code*, Section 25501).

Hazardous materials release site: Any area, location, or facility where a hazardous material has been released or threatens to be released to the environment (*California Health and Safety Code*, Section 25260(e)).

Hazardous substance: See "hazardous material."

Hazardous waste: Waste that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to an increase in mortality or an increase in

serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed (*California Health and Safety Code*, Section 25117.

Head: Head (hydraulic head, piezometric head, groundwater head) is a measurement, in length, of the elevation to which water will rise in a well. It is related to water pressure and density. Groundwater always flows from high head to low head.

Hydromodification: The change in the stream flow hydrograph (e.g., flow rate, timing of peak flows, flow duration, and flow volume).

Intact Archaeological Deposit: An archaeological deposit in which the original or stratified association of archaeological remains are retained within an archaeological site.

Interim target level (ITL): Calculated site-specific concentration of a chemical in soil that would be used to identify locations in Candlestick Point sub-areas not subject to Article 22A testing that could require risk management measures during project development.

Lead: Occurs in the atmosphere as particulate matter. Sources of lead include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

Lithology: The physical character of a rock or rock formation.

Local Electrical Capacity: A function of the capacity of the transmission network to convey power to a service area, the capacity of the local substations to "step down" the power to deliverable voltages, and of the adequacy of the local distribution network to deliver power to end users.

Mélange: A mélange (French for "mixture") is a large body of rock characterized by a lack of bedding and includes rock fragments of all sizes contained in a fine-grained matrix. A mélange typically consists of a jumble of blocks of varied rock types.

Metamorphosed Rock: Metamorphosed rock is igneous or sedimentary rock that has been transformed, or 'metamorphosed', by intense heat and pressure (temperatures greater than 150 to 200 °C and pressures of 1500 bars) causing profound physical or chemical changes.

Micropascal: A measure of pressure per unit area where 1 micropascal equals 0.0000145 pounds per square inch.

Modified Mercalli Intensity (MMI) Scale: A 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. Effects range from those which are detectable only by seismicity recording instruments (I) to total destruction (XII). Most people will feel Intensity IV ground motion indoors and Intensity V outside. Intensity VII frightens most people, and Intensity IX causes alarm approaching panic. The scale was developed in 1902 by Giuseppi Mercalli for European conditions, adapted in 1931 by American seismologists Harry Wood and Frank Neumann for conditions in North America, and modified in 1958 by Dr. Charles F. Richter to accommodate modern structural design features.

Moment Magnitude (M): A logarithmic scale introduced by Hiroo Kanamori in 1977 that is used by modern seismologists to measure the total amount of energy released by an earthquake. For the purposes of describing this energy release (i.e., the "size" of an earthquake on a particular fault segment for which seismic resistant construction must be designed) the moment magnitude (M) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating among the sizes of earthquakes above M 7.5. To correct for this effect, the formula used for the M scale incorporates parameters associated with the rock types at the seismic source and the area of the fault surface involved in the earthquake. Thus, the moment magnitude is related to the length and width of the fault rupture. It reflects the amount of "work" (in the sense of classical physics) done by the earthquake. The relationship between Richter and moment magnitudes is not linear (i.e., moment magnitude is not a set percentage of Richter magnitude): the two values are derived using different formulae. The four well-studied earthquakes listed below exemplify this relationship.

Location	*Date*	*Richter Magnitude*	*Moment Magnitude*
New Madrid MO	1812	8.7	8.1
San Francisco CA	1906	8.3	7.7
Anchorage AK	1964	8.4	9.2
Northridge CA	1994	6.4	6.7

Although some of the values shown on the M scale appear lower than those of the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

Multi-Sector General Permit: Provides coverage for industrial facilities located in five states, in certain Native-American lands, as well as for various federal facilities, where USEPA is the NPDES permit authority.

Municipal Separate Storm Sewer System (MS4): An MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) *(i)* designed or used for collecting or conveying storm water, (ii) that is not a combined sewer, and (iii) that is not part of a Publicly Owned Treatment Works. The term MS4 also refers to the jurisdiction that operates such a system.

Native soil: Soil that exists in BWP project site that does not contain fill materials.

National Geodetic Vertical Datum (NGVD29): Equivalent to -1.77 feet based on the San Francisco City Datum, or roughly equivalent to mean sea level.

Naturalized Plants: Those that were originally installed as ornamental plantings but are now found growing 'naturally' in a variety of habitats.

Nitrogen Dioxide: A reactive, oxidizing gas capable of damaging cells lining the respiratory tract which is an essential ingredient in the formation of ozone.

North American and Pacific Plates: Tectonic plates that cover most of North America and the Pacific Ocean, respectively. These two plates have formed a transform boundary (where two plates grind past one another) on the western edge of California, along the San Andreas Fault system.

Oil and Grease (O&G): At very low concentrations, O&G can cause sheen on the surface of water. O&G can adversely affect aquatic life, create unsightly floating material, and make water undrinkable.

Offset Surface: Surfaces not in alignment, or offset, from each other that may have arisen from old landslides.

Orthents Soils: In USDA soil taxonomy, Orthents are defined as Entisols (soils that do not show any soil profile development) that lack horizon development due to either steep slopes or parent materials that contain no permanent weatherable minerals.

Outfall: An outfall is a pipe that discharges treated stormwater and wastewater flows into a receiving water body.

Overconsolidated: Subjected to an effective pressure greater than the pressure of the present.

Overflow: A pipe that discharges flows that exceed the capacity of the combined sewer system during heavy rain.

Ozone: A gas that is formed when reactive organic gases (ROG) and nitrogen oxides (NO_X)—both byproducts of internal combustion engine exhaust—undergo slow photochemical reactions in the presence of sunlight.

Pathogen Indicator Bacteria: Although they are not generally harmful themselves, these bacteria indicate the possible presence of disease-causing bacteria, viruses, and protozoa.

pH: A numeric measurement of the hydrogen-ion concentration in water.

Pier: A structure that extends out over the water.

Pollutant Loads: The amount of pollutants entering a water body, generally expressed in terms of mass released over a given time frame (e.g., pounds/day).

Polycyclic aromatic hydrocarbon (PAH): Organic chemical byproduct formed by the incomplete combustion of raw fuel materials, typically present as a constituent of heavy-end fuels (e.g., diesel) or other petroleum-based products such as asphalt.

Powered Construction Equipment: Any tools, machinery, or equipment used in connection with construction operations which can be driven by energy in any form other than manpower, including all types of motor vehicles when used in the construction process of any construction site, regardless of whether such construction site be located on-highway or off-highway, and further including all helicopters or other aircraft when used in the construction process except as may be preempted for regulation by state or federal law.

Quaternary: The geologic time period after the Neogene period, approximately 1.8 million years ago to the present.

Quay Wall: A wharf or bank that is constructed to accommodate the loading of ships and other vessels.

Reclaimed Complex Soils: Soils found on reclaimed land, such as tidal flats that were once part of San Francisco Bay.

Record of Decision: A signed federal document representing the culmination of the federal environmental document review and approval process, and documenting federal project environmental approval. Mitigation measures that will be incorporated in the project are typically summarized in an attached appendix.

Remedial action or **remediation:** Actions required by state or local laws, ordinances, or regulations necessary to prevent, minimize, or mitigate damage that may result from the release or threatened release of a hazardous material (*California Health and Safety Code*, Section 25260(g)). These actions include the cleanup of the site, monitoring, testing and analysis of site conditions, site operation and maintenance, and placing conditions or restrictions on the land use of the site upon completion of remedial actions.

Retention: Capturing stormwater runoff and preventing discharge from the detention device.

Respirable Particulate Matter: Extremely small, suspended particles or droplets 10 microns or smaller in diameter.

Reverse-slip Fault: A fault with predominantly vertical movement in which the upper block moves upward in relation to the lower block.

Richter Magnitude Scale: The Richter Magnitude Scale is a logarithmic scale developed during 1935 and 1936 by Dr. Charles F. Richter and Dr. Beno Gutenberg to measure earthquake magnitude by the amount of energy released, as opposed to earthquake intensity as determined by local effects on people, structures, and earth materials (as in the Modified Mercalli Intensity Scale). Each whole number on the Richter scale represents a 10-fold increase in amplitude of the waves recorded on a seismogram and about a 32-fold increase in the amount of energy released by the earthquake. Because the Richter scale tends to saturate above approximately M 7.5, it is being replaced in modern seismologic investigations by the moment magnitude (M) scale.

Risk: The probability of exposure to hazardous material and severity of harm that exposure would pose to human health or the environment, where the degree of risk is a function of the means of exposure, in addition to the inherent toxicity of the material.

San Francisco City Datum: A local vertical geodetic reference system specific to the City and County of San Francisco and formally established in 1964 as 8.616 feet above the National Geodetic Vertical Datum of 1929 (NGVD29), making it about 8.13 feet above mean sea level.

Seawall Lot: A parcel of land, generally located on the land side of a waterfront roadway, which was created when the seawall was built.

Semi-volatile organic compound (SVOC): An organic chemical that readily, but only partially, evaporates or changes from a liquid to gas at temperatures normally found at the ground surface and at shallow depths.

Serpentinite: A rock composed almost entirely of serpentine materials.

Shadow Fan/Shadow Trace: A figure identifying the maximum extent of all project-related shadows from one hour after sunrise to one hour before sunset for an entire year.

Shale Matrix: Shale, or mudstone, is a fine-grained sedimentary rock, usually formed from clay minerals compacted together by pressure. The matrix, or groundmass, is the fine-grained mass of material in which other larger grains are embedded within.

Shear Strength: Describes the maximum strength of soil at which point significant plastic deformation (yielding) occurs due to an applied shear stress.

Shear Zone: A wide zone of sheared rock, where intense foliation and deformation may occur. The zone may be associated with a fault, but it is often difficult to distinguish a fault plane in the zone.

Sheet Piles: Flat metal "boards" that are driven into the substrate with a pile driver. They interlock with each other to form a vertical water tight wall.

Specific Conductance (SC): A numerical expression of the ability of water to carry an electric current.

Subduction: An area where two tectonic plates converge and move towards one another, with one sliding underneath the other and moving down into the earth's mantle, part of the earth's internal structure.

Sulfur Dioxide: A colorless, extremely irritating gas or liquid.

Surcharging: Overloading and flooding of the drainage system.

Terrane: A crustal block or fragment that is typically bounded by faults which has a geologic make-up distinct from those of surrounding areas.

Total Organic Carbon (TOC): An indicator of the total organic matter present in water.

Total petroleum hydrocarbons (TPH): Fuel products such as diesel, gasoline, and motor oil containing organic chemical compounds of varying types and concentrations that are specific to type product.

Total Suspended Solids (TSS): An indicator of the undissolved solids in stormwater runoff.

Toxic: Concentration of a substance that would be lethal or produce other adverse responses detrimental to the health of an organism.

Toxic Hot Spots: Locations in enclosed bays, estuaries, or the ocean where pollutants have accumulated in the water or sediment to levels that (1) may pose a hazard to aquatic life, wildlife, fisheries, or human health; (2) may impact beneficial uses; or (3) exceed State Water Resources Control Board or Regional Water Quality Control Board-adopted water quality or sediment quality objectives.

Treatability Studies: Pilot-scale type tests conducted at hazardous wastes sites to determine if a treatment technology will work for that site's particular set of environmental conditions.

Urban Land: Per USDA soil taxonomy, Urban Land is soil that has been modified by disturbance of the natural layers with additions of fill material several feet thick to accommodate large industrial and housing installations.

Volatile Organic Compound (VOC): An organic chemical that readily evaporates at temperatures normally found at the ground surface and at shallow depths.

Waffling Grade: A surface texture marked by ridges and valleys that would help to channel flow.

Waste Discharge Requirement (WDR): WDRs are regulatory requirements pertaining to water quality. WDRs may apply to a general activity or program (e.g., construction runoff) or they may be specific to a particular facility. An NPDES permit is an example of a type of WDR.

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